P Pharm.

AEROSOL AGE

THE MAGAZINE OF PRESSURE PACKAGING

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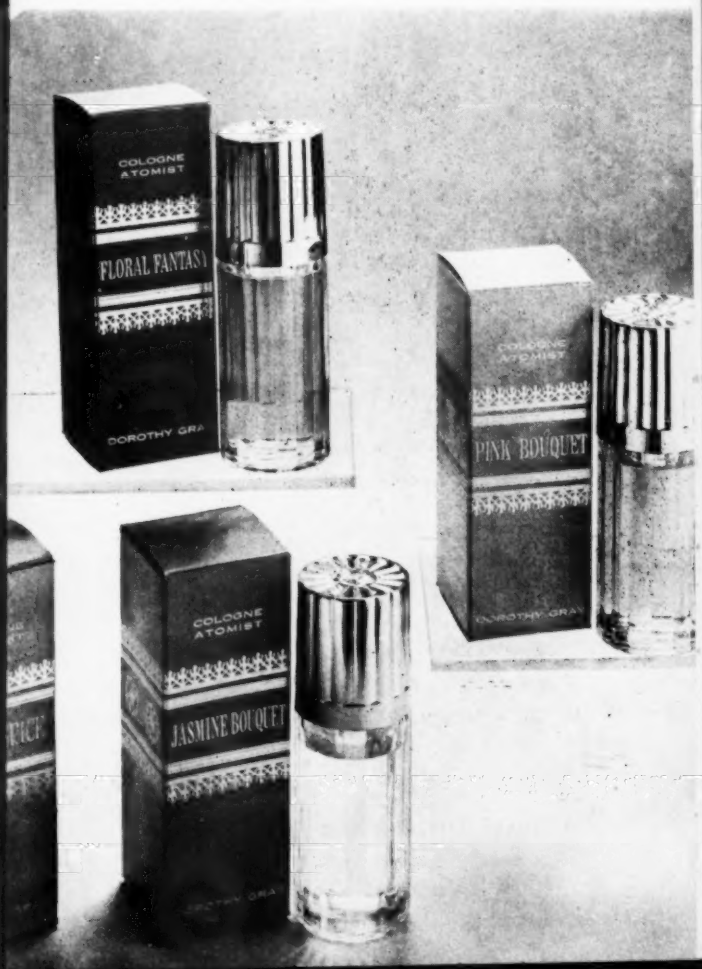

Aerosols in South Africa

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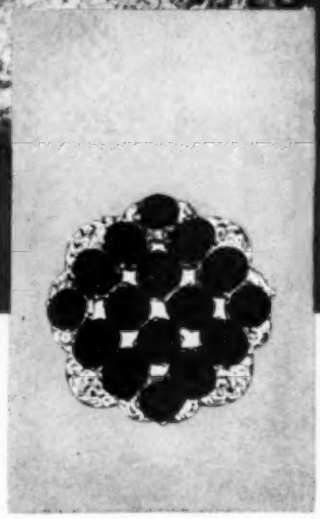
SCC Dublin Symposium

NOVEMBER, 1960



Why every facet of a Norda Fragrance sparkles true to Nature

Odor "gems" Norda creates capture all that Nature intended—reflect the master-touch Norda experts have with the world's best raw materials.

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1. K-38 "tilt-action" valves. 2. KN-38 "all nylon" push-down valves. 3. AR-74 "paint and lacquer" valves

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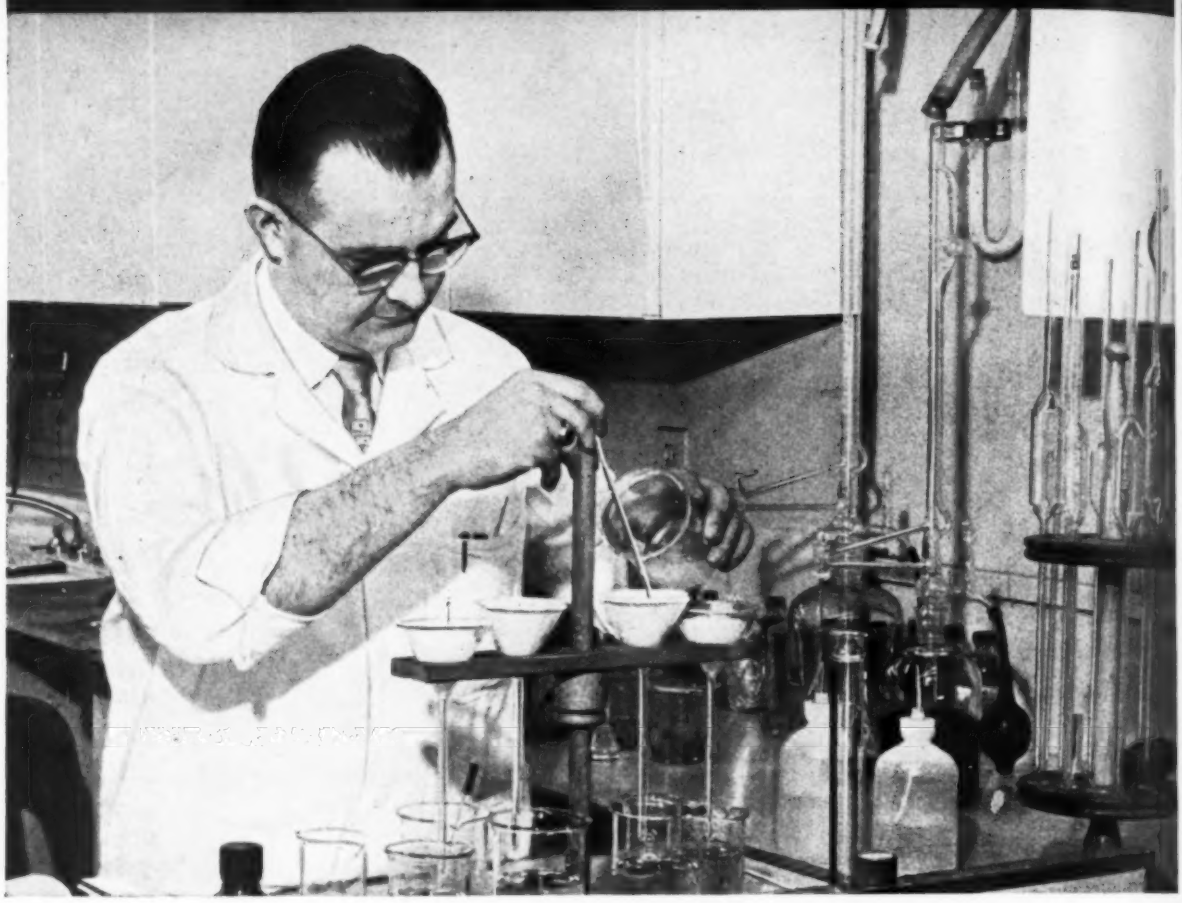
The contract packager had the answer... *another success story from the ISOTRON file.*



He guards your good name in aerosols

Wonder whether a contract packager can meet your high standards of quality? You can relax if Aerosol Techniques, Inc., of Bridgeport, Conn., handles your job. This outstanding firm has the experience, people and equipment to accomplish the most exacting program of quality control for the most exacting marketer.

Such a program is tailored to your product when an ATI account executive accepts your order. Quality control procedures are set up to meet your precise specifications. All incoming packaging materials are rigorously examined; in-process testing further assures the quality of your product; and frequent testing of retained samples is another quality check. In the filling of cosmetic, pharmaceutical, food, household, industrial and chemical aerosols, ATI's product development laboratories, research, technical and service staffs can serve you well.

An experienced packager like ATI can help reformulate your product to achieve the quality results you want. His recommendation of the proper can, valve and propellent is invaluable, too. More than ever, quality-conscious packagers specify Pennsalt ISOTRON® . . . the extra-pure, extra-dry propellents that are factory-sealed for your protection.

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THIS MONTH'S COVER

Among the many new aerosol colognes introduced for the Christmas market is this "series" brought out last month by Dorothy Gray Ltd., New York. Including "Floral Fantasy," 'Pink Bouquet," "Jasmine Bouquet," and "Sweet Spice," the line uses a Foster-Forbes uncoated bottle, a VCA "B-8" valve and mechanical breakup actuator, and a PharmaPlastic overcap. Units are filled by Aerosol Techniques, Inc., Bridgeport.

NOVEMBER, 1960 VOL. 5, No. 11

AEROSOL AGE

The magazine of pressure packaging

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Wayne E. Dorland
Publisher

Donald A. Davis
Editor

Eleonore T. Kanar
Technical Editor

Tom C. Clark
European Representative

Ralph Dorland
Advertising Manager

Richard Stearns
District Manager

Doris Metz
Circulation

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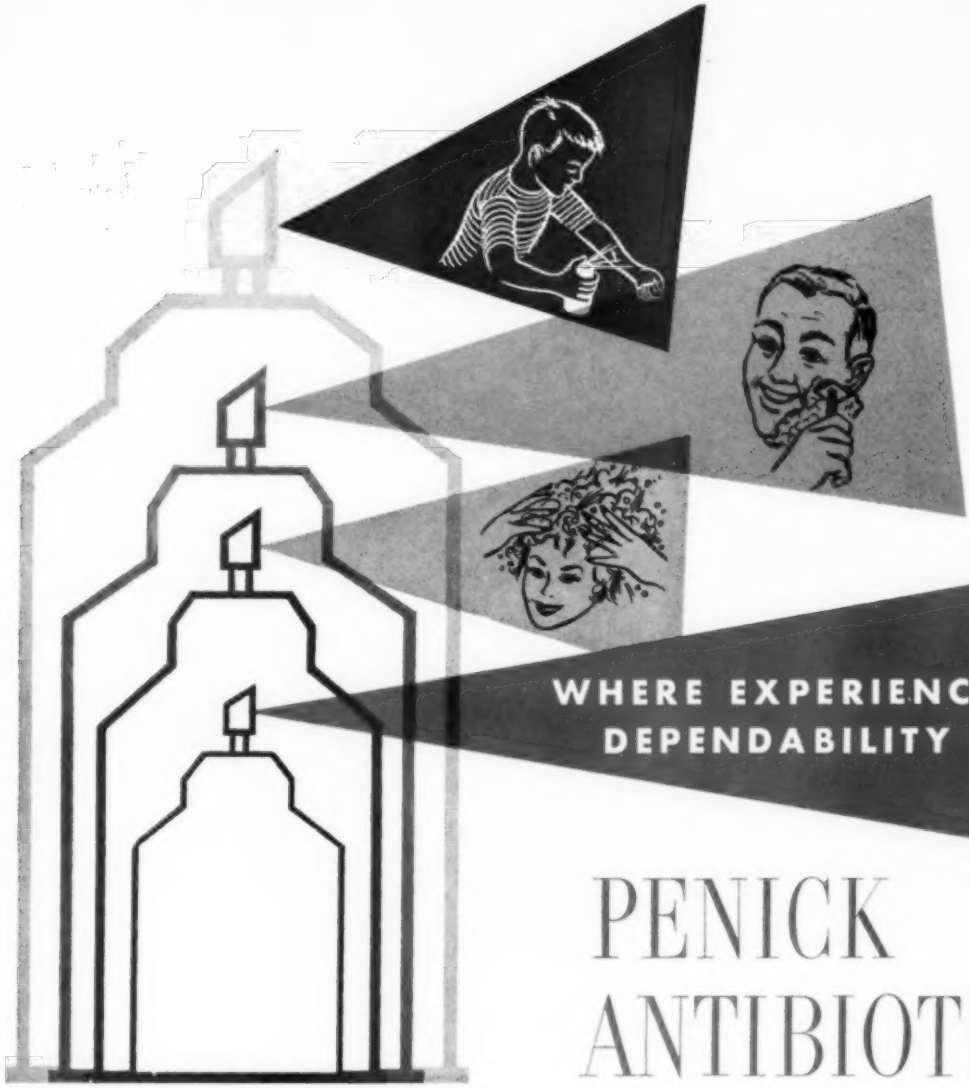

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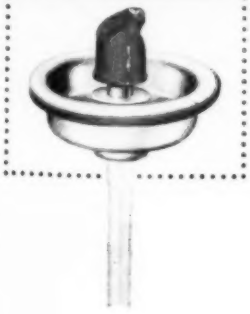

Meet experienced engineers in the Aerosol Valve Industry. ■ Talk with laboratory people who can help analyze your product. ■ Learn the value of a century-old tradition of quality. ■ See up-to-the-minute production facilities. ■ In short . . . MEET SCHRADER . . . and see for yourself.

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INDUSTRY MEETING CALENDAR

Packaging Institute, 22nd annual national packaging forum. Statler-Hilton Hotel, New York.....Oct. 31-Nov. 2

Society of Cosmetic Chemists, N. Y. Chapter. Hotel George Washington, New York.....Nov. 2

Society of Cosmetic Chemists, Chicago Chapter, Henrici's Restaurant, Chicago.....Nov. 15

Toilet Goods Association, scientific section, fall meeting, Waldorf Astoria, New York.....Nov. 30

Chemical Specialties Manufacturers Assn. 47th annual meeting, Hollywood Beach Hotel, Hollywood, Fla. .....Dec. 3-9

American Management Assn., Product & Package Design & Development Forum, Hotel Astor, New York .....Dec. 19-21

Chemical Specialties Manufacturers Association, Meeting of Board of Governors, Division Executive Boards and Committees, Hotel Peabody, Memphis, Tenn. March 8-9, 1961

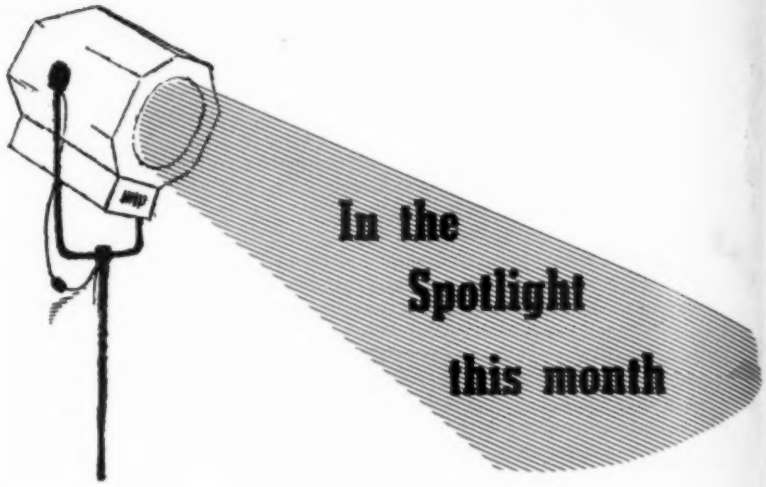
National Packaging Exposition and National Packaging Conference of American Management Association, Exposition Center, Chicago.....April 10-13, 1961

•

Pfaudler Buys Research Firm

Pfaudler Permutit, Inc., Rochester, last month acquired AeroChem Research Laboratories, Inc., Princeton, N. J., for an undisclosed number of Pfaudler Permutit shares of stock. The Princeton firm, founded in 1956, is engaged in basic research on a contract basis for industry and government. AeroChem will continue to operate under the direction of Dr. Hartwell F. Calcote, vice-president and director of research.

Pfaudler Permutit, with four plants in the U. S., has manufacturing subsidiaries or affiliates in Germany, Canada, Great Britain, Japan, and Mexico. The company makes heat exchangers, liquid fillers, and a wide range of other equipment.



• **The Technical Aspects of Aerosol Air Fresheners (Part II)** . . . Following a general discussion of aerosol air fresheners in his first installment last month, Montfort Johnsen continues his excellent series with a detailed discussion of the deodorant qualities of Metazene, Meelium, and certain common perfume materials. Beginning on page 20, he analyzes the relative merits and performance of each of these materials in a variety of formulations.

• **Aerosols in South Africa** . . . On page 27, a South African aerosol expert tells of some of the early complications encountered with pressurized packaging. He also describes the state of the industry in that country today.

• **Non-Aqueous Aerosol Foams** . . . P.A. Sanders, who is well-known to the aerosol industry for his work with propellants and propellant systems, sheds new light on non-aqeuous foams (on page 33). Reporting on more than a score of workable formulations, he predicts new uses for this type of aerosol product.

• **Aerosols at the Hardware Show** . . . The National Hardware Show, always a good barometer for the aerosol industry's progress in this retailing area, again proves that the pressurized package is capable of recording big gains over the course of a year. New marketers and new products are discussed on page 29.

you have to
manufacture
Quality
into a
product
At Newman-Green we believe in the axiom of all true craftsmen. Quality cannot be inspected into a piece—it has to be built into the piece.
The aerosol manufacturing and sales policy based on product quality, service and honesty will *always* provide you with the best buy. This is just as true on the smallest orders as it is on the largest orders. Newman-Green customers are assured of this fine craftsmanship because our first concern is to provide you with the best product quality possible for the money spent. Call your Newman-Green representative today.

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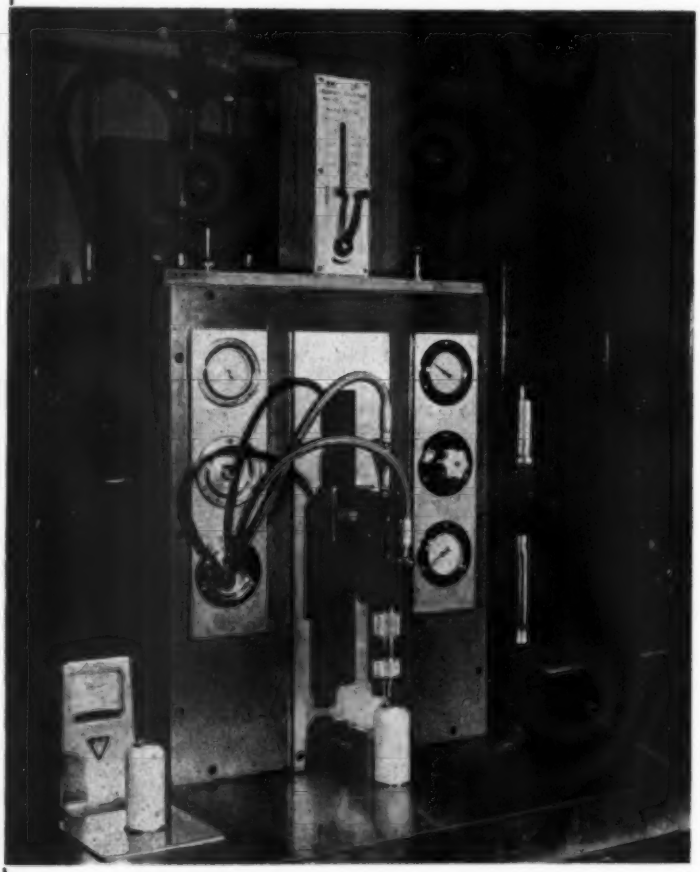
Europe's Most Advanced

AEROSOL PRESSURE FILLING EQUIPMENT

For all production requirements (small, medium, large)



- Fully automatic — up to 40 units per minute.
- Semi-automatic single machines — up to 30 units per minute (product filler, valve clincher, propellant charger).
- All equipment is fully pneumatically operated. No electrical controls or connections. The ultimate in safety.

Also offered are all auxiliaries, propellant pumps, accumulators, purgers, unscrambler tables, conveyor tracks, coders, tank type or fully automatic magnetic chain link belt test baths for semi-automatic or fully automatic lines.

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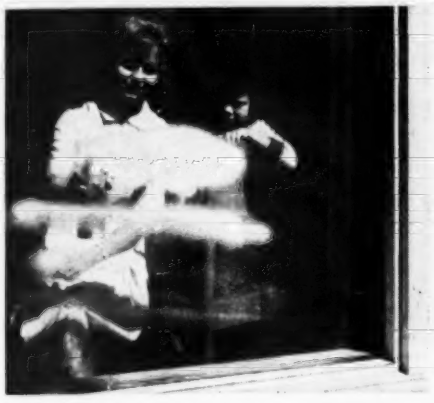
SILICONE NEWS from Dow Corning

Spray Way To Sales



For a prettier profit picture ... Dow Corning Silicones

To be sure your aerosol products sell and resell, formulate with Dow Corning Silicones. Because silicones — whether for cosmetic, polish, or industrial uses — provide the performance that pleases and brings customers back to buy again and again.

Take cosmetics. Silicones in the formulation mean creams and lotions that spread easily, work-in smoothly, "stay put". The skin never feels greasy; remains free to "breathe"; is effectively protected against waterborne irritants. Hair sprays impart lasting luster, greater manageability.

Or polishes for cars, furniture or glass. Silicone-based polishes mean almost no rubbing. A deeper, richer gloss is more easily attained and maintained. Greater resistance to oxidation is "built in" — Dow Corning Silicones give a polish job greater durability.

Industry, too, uses silicone aerosol products. Silicone release agents, for example, make plastic parts pop out of molds quickly, easily. Rejects, downtime and maintenance costs are slashed because silicones are heat-stable — won't melt or run off, won't form heavy carbonaceous build-up on the mold. Detail is perfect, close tolerances are held time after time.

Whatever you formulate or package for private label, remember silicones make good products better ... improve profits by selling and reselling. And remember, too, that Dow Corning chemists are constantly working to develop new silicones and new aerosol formulations. Write today for the latest and most complete technical information—about silicones in cosmetics, polishes, specialties or in industrial products.

Learn how silicones can serve you — profitably. Write Dept. 0211.

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MEASURED PERFUME: More than 200 sprays. Stainless Steel Bottle of 10 cc overflow capacity. 18 mm finish. VCA B18F Metered Valve, low volume discharge. Custom designed metal actuator.

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Thousands of insecticide users have found a short cut in determining the quality of an insecticide product. They turn to the label and look for the words piperonyl butoxide and pyrethrins!

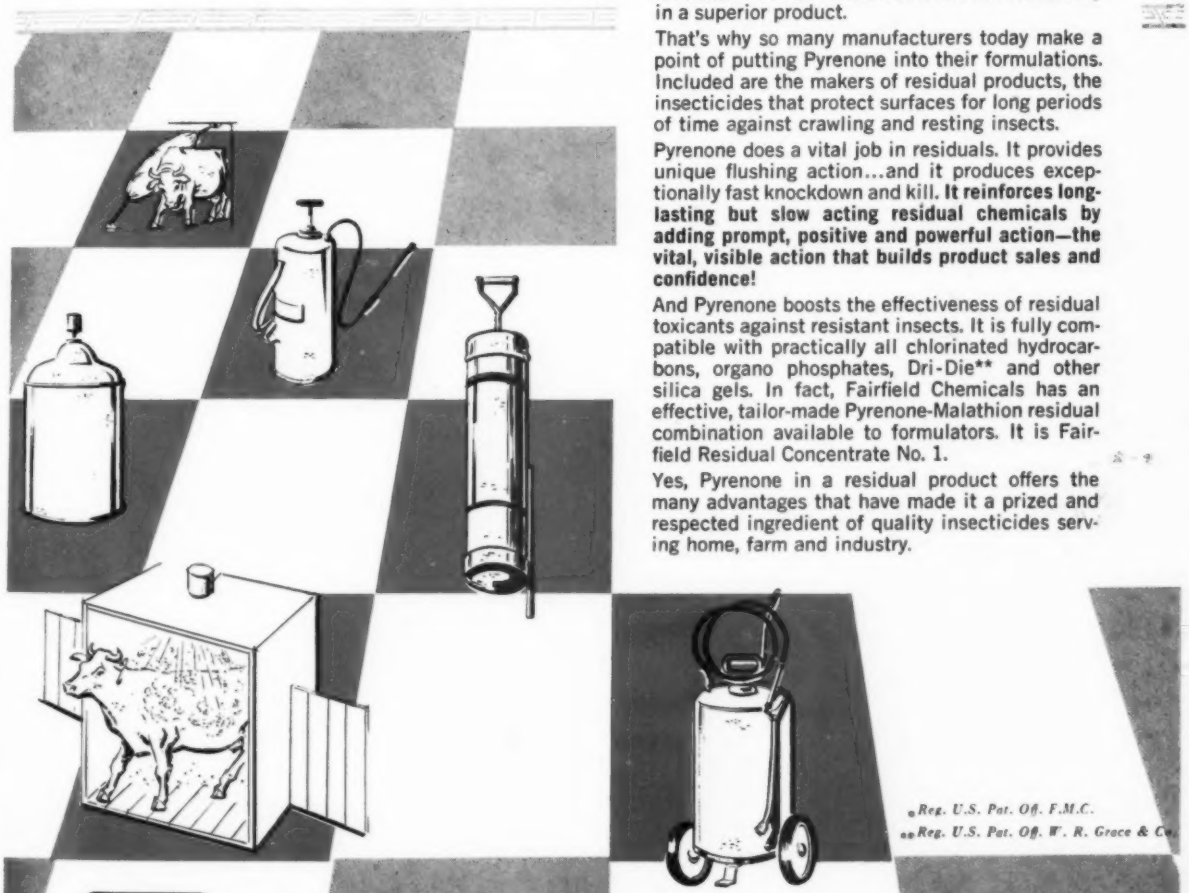
Known as Fairfield Pyrenone, this combination spells quality. It assures the user of peak performance—the fast knockdown and kill found only in a superior product.

That's why so many manufacturers today make a point of putting Pyrenone into their formulations. Included are the makers of residual products, the insecticides that protect surfaces for long periods of time against crawling and resting insects.

Pyrenone does a vital job in residuals. It provides unique flushing action...and it produces exceptionally fast knockdown and kill. **It reinforces long-lasting but slow acting residual chemicals by adding prompt, positive and powerful action—the vital, visible action that builds product sales and confidence!**

And Pyrenone boosts the effectiveness of residual toxicants against resistant insects. It is fully compatible with practically all chlorinated hydrocarbons, organo phosphates, Dri-Die** and other silica gels. In fact, Fairfield Chemicals has an effective, tailor-made Pyrenone-Malathion residual combination available to formulators. It is Fairfield Residual Concentrate No. 1.

Yes, Pyrenone in a residual product offers the many advantages that have made it a prized and respected ingredient of quality insecticides serving home, farm and industry.



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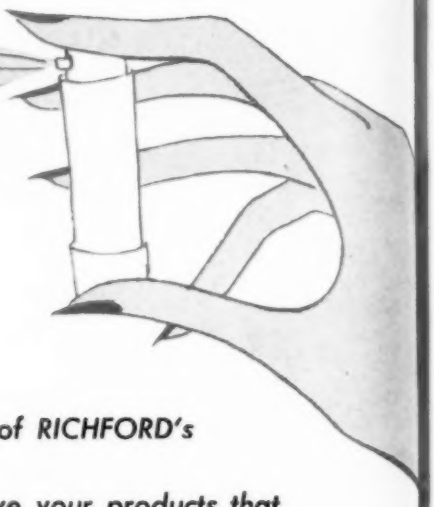

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Wide choice of color and color combinations in refillable plastic containers. Available in 2 styles of spray heads with brass shell in polished or design background.

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- Ready to use—nothing to remove
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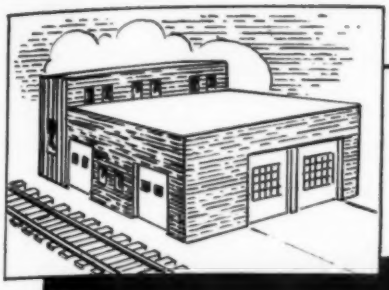
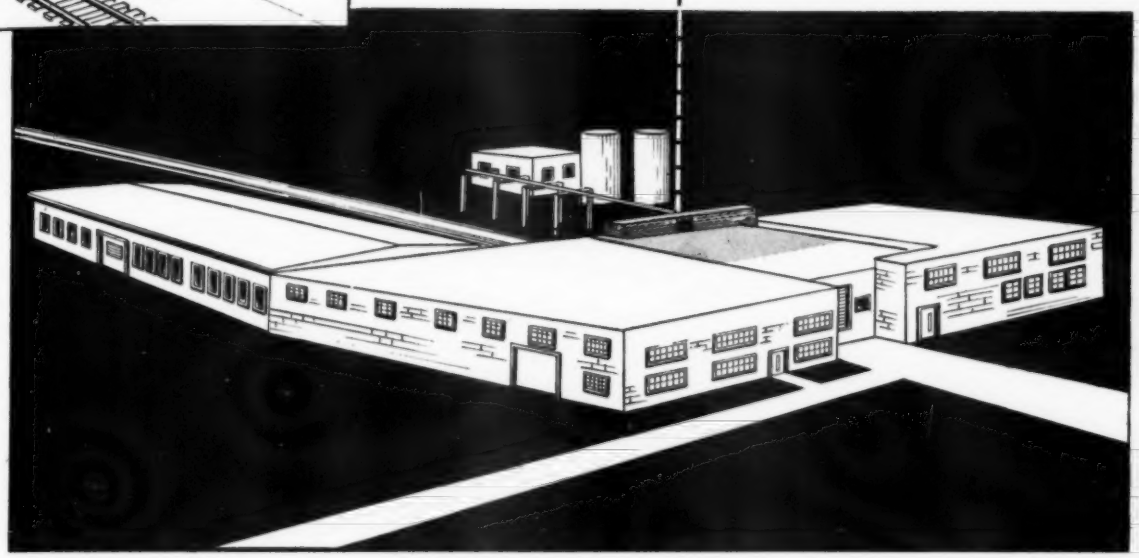


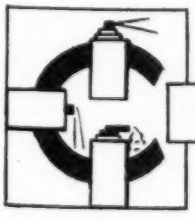
GROWTH IS IMPORTANT



and CONTINENTAL FILLING CORPORATION Has Kept Pace with a Billion Dollar Baby

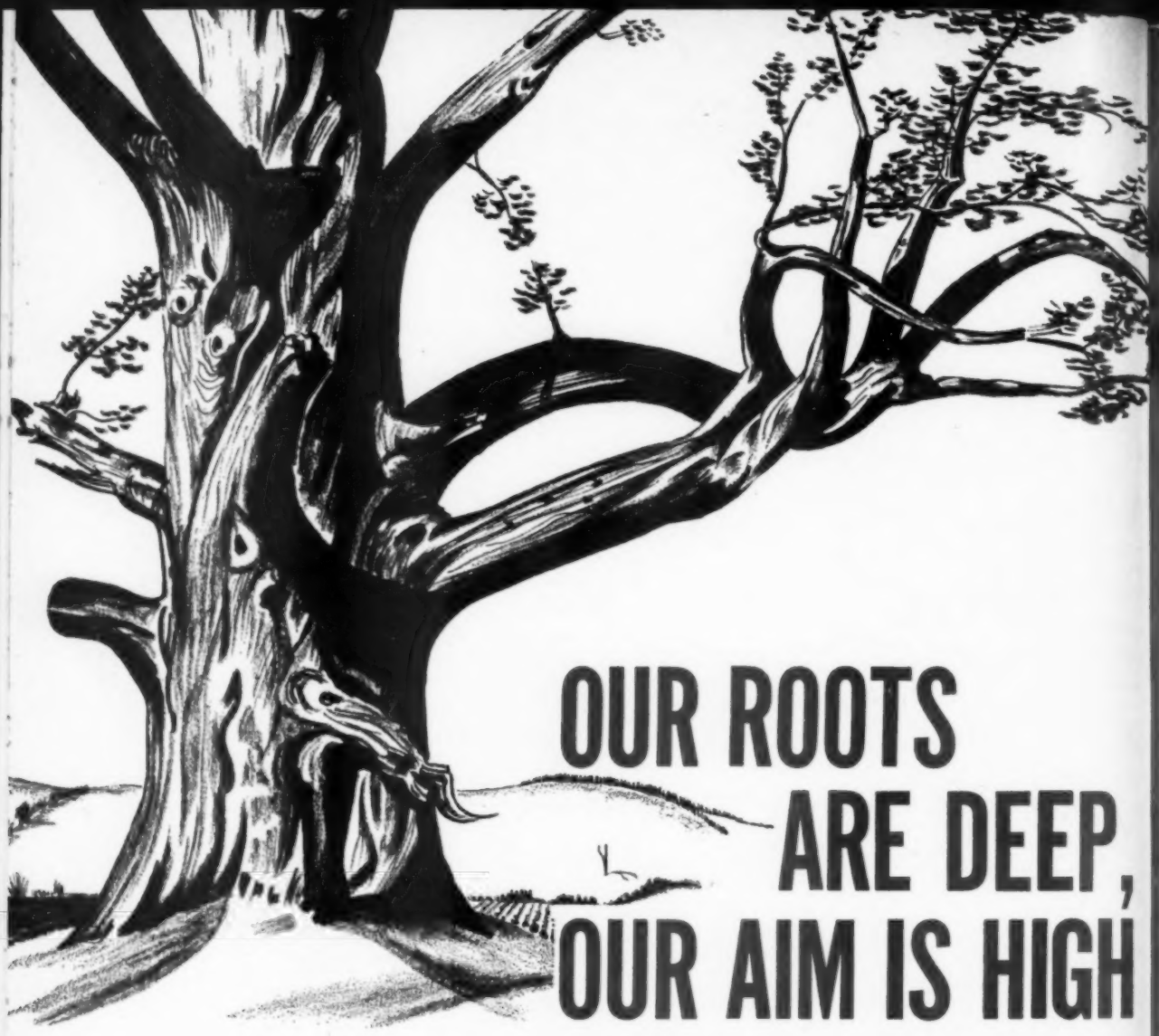
Since 1946, Continental Filling Corporation has specialized in pressure packaging. In the past 14 years, Continental Filling Corporation has kept pace with this billion dollar industry with continual plant expansion. Perfection of techniques, and the development of new procedures has placed Continental Filling Corporation as the forerunner when it comes to something new for your pressure packaged product.

Contact Continental Filling today . . . call on 14 years of research, development and production know-how.



CONTINENTAL FILLING CORPORATION

Danville, Illinois



OUR ROOTS ARE DEEP, OUR AIM IS HIGH

but Valves don't grow on trees

Some fifteen years ago, the aerosol industry was born. Shortly after, the Precision Valve Corporation began. As the industry grew, Precision did too, in research, in discovery, in development.

Today, with over 500 employees and more than 60,000 square feet of manufacturing space devoted to over 10,000 different combinations of specifications for aerosol valves, Precision works with the industry to create and develop new aerosol designs to improve current procedures.

Now, on the threshold of further expansion, Precision rededicates itself to serving the aerosol industry and its customers. A major portion of Precision's new plant program will be directed toward research and development; its modern production facilities further improved; its friendly hand extended and dedicated to helping everyone.

Yes, Precision's roots are deep . . . its aim high!

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EDITORIALS

"Beating the Bushes" . . .

WHAT can the custom filler do to adequately protect himself against serious losses involved when one of his major customers installs his own production line? Where can he recruit business to fill "the production gap" which is bound to develop in his production scheduling, work-force, and warehousing?

If there *is* a quick solution to this basic vulnerability in the custom filling business, it hasn't yet made itself apparent to the bulk of the major custom fillers — many of whom have already faced the problem or will in the near future. Raiding of the accounts of other fillers is one course which has been followed—usually with indifferent success especially if it necessitates unrealistic price cutting and (in rarer cases) short-cutting of quality control procedures. Another course which has met with more success is careful planning, by the individual filler, in order to widen the range of his accounts so that loss of one results in loss of only a segment of the business. But this requires good customer recruiting from the beginning, coupled with a good deal of luck —since the loss of two or three accounts could have the same effect on a medium-sized filler as the loss of one does on a smaller filler.

The subject of customer recruiting is one about which probably too little has been said. As was pointed out in this column last month, an adequate sales force—one capable of "beating the bushes" for new accounts—is essential. And even if this sales strength must be achieved at a slight sacrifice of research personnel, it will prove itself worth the effort. But where might this sales force look for new customers?

Obviously, a good salesman should scour his sales area with an eye toward not those already in the aerosol business, but those *not yet* in it. A survey of hardware, food, and drug stores in any major geographical marketing area will uncover a whole hatful of prospective marketers who are currently packaging their product in conventional can, tube, jar, squeeze bottle, roll-on bottle, or some other "infernal device" which offers far less than the aerosol in the all-important aspect of convenience. When this new customer is contacted, he should be shown what the aerosol has done for a product either in his own field, or in one in which similar packaging problems exist. This effort, in effect, will mean that each custom filling salesman must become an aerosol teacher, familiar with a good many products not necessarily packaged by his own company.

And now comes an important point which perhaps has been underemphasized of late: *No matter how small the prospective customer, and whatever the size of his first filling order, he should be treated with the same courtesy and given the same service as a million-can customer!* If this necessitates the maintenance of a special small filling line (which perhaps won't really pay for itself) then such a line should be installed. If existing equipment can be made to do the job (without excessively expensive clean-up and change-over) then this may offer a solution.

The principal factor to consider here is that it is difficult to predict just *which* product will become the next 25-million-unit seller. New business must come to the custom filler in a continuing stream if he is to maintain his competitive position, and the marketer seeking an initial run of say 5,000 containers is too valuable a potential to turn away in search of bigger fish. After all, the bigger fish will be the mark of all the other fillers too. ★

This article, second of a series of three, continues what will likely be recognized as the most complete and most informative work ever written on this important subject.

The Technical Aspects of Aerosol Air Fresheners

Part II

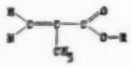
In this installment, Mr. Johnsen discusses Metazene and Meelium as deodorant materials, and the role of perfumes.

By Montfort A. Johnsen

Director of Research
Peterson Filling & Packaging Co.
Danville, Ill.

Metazene as a Deodorant

THE deodorant "Metazene" was introduced by Kilgore Chemicals, Inc. in 1950[36] and has enjoyed fairly widespread use ever since. It is a light amber liquid of low volatility and surface tension, having a very slight clean odor somewhat reminiscent of that of diluted laurylaldehyde. The principal constituent is n-lauryl methacrylate. The remaining ones consist of other fatty alcohol esters of methacrylic acid, having the general formula:



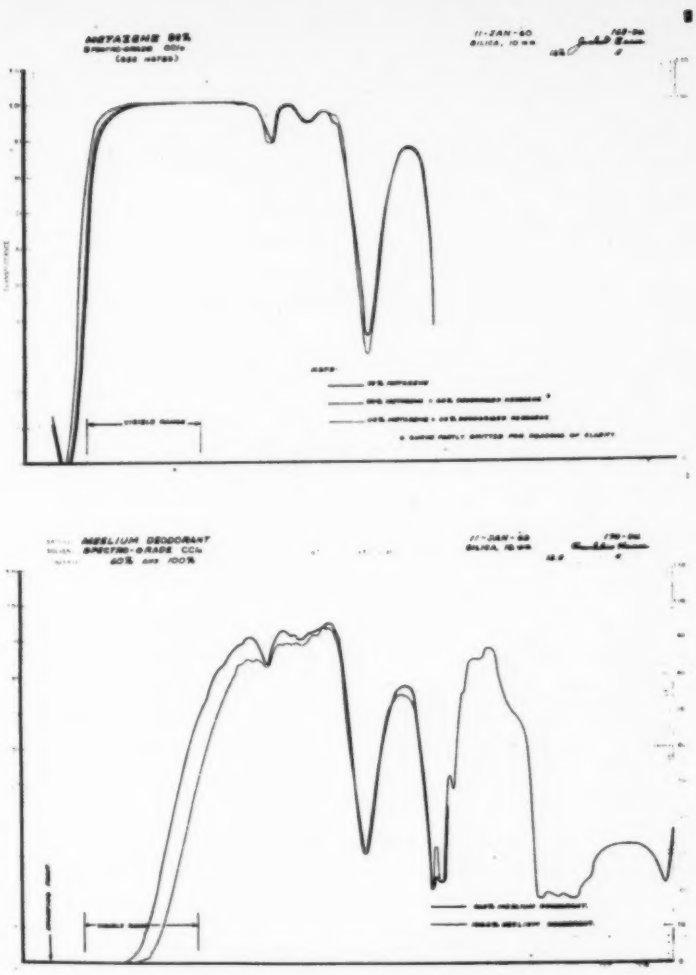
where "R" is an alkyl group ranging in complexity from C_8 to about C_{14}.

When alkyl groups lower than C_8 are present, the methacrylate esters become not only more reactive but also more odoriferous. Because of their increased volatility the lower esters evaporate rapidly into the air

from aerosol particles and cause unfortunate side reactions which are initiated by oxygen and lead to polymerization.[37] Some of the deodorizing action of Metazene is attributed to the ability of the airborne particles to *physically dissolve* amines, sulfides, pyridines, and other odorous materials. Obviously, a substance already in gaseous form cannot dissolve other materials, and this has been used to explain some of the curious experimental results found with the lower esters.[38] Finally, the reactivity of these esters[39] causes them to favor polymerization on a non-selective basis. Malodorous molecules are often not reactive enough to compete with monomeric methacrylate molecules during the polymerization process, with the result that a large percentage of the homo-polymer is formed. Less odor is destroyed under these conditions.

As the size of the alkyl group increases beyond C_8, the methacrylate esters become quite insoluble in water. A certain degree of water solubility was mentioned earlier as one of the criteria for odor perception. Lauryl methacrylate combines the advantages of fair reactivity and low irritation. Still higher esters remain bland, but as the size of the alkyl groups increases they become too inactive for good odor control.

By dissolving Metazene in a base which is capable of slow evaporation, the aerosol droplets are found to achieve a maximum deodorizing effect. This is commonly done by diluting the ester in five to ten parts of a low odor petroleum distillate having a fractionation range of about 340° to 410°F. The slow evaporation of distillate from airborne particles (formed by the aerosol freshener) will then permit fresh surfaces of Metazene to be continually exposed to the air. Some of the ester will also evaporate from the turbulent surface, but at a rate considerably slower that that of the solvent itself. These ideas indicate that the particle size of a Metazene deodorant will be quite important. The total evaporation rate is a function of droplet diameter. The evaporation rate must be significant, but yet not overly rapid. If the particle size is too large, some fraction of the sprayed product may be expected to fall out of the air prematurely. The period of substantial activity is from 10 minutes to one hour after spraying, depending upon the formula, valve style and air movement.[40]



Spectrophometric curves for Metazene and Meelium

THE selection of a diluent for Metazene must be made with some care. The alcohols are too volatile. Conversely, the glycols evaporate with such extreme slowness that the methacrylate remains "drowned in a sea of solvent," except for a tiny fraction at the surface which is insufficient for adequate control. Of the petroleum distillates, only two classes have taken on commercial significance. The first, which is a completely synthetic alkylate-type called "Odorless Mineral Spirits," is a complex mixture of highly cross-chained isoparaffinics boiling through the range 350° to 410°F. Tighter ranges are available but are not recommended for use. The second diluent is variously described as high flash mineral spirits or low end point deodorized kerosene. The distillation range is similar to that of the alkylate, except for tailings which may go a little higher. These compounds analyse about 75% paraffinics and 25% napthenics.

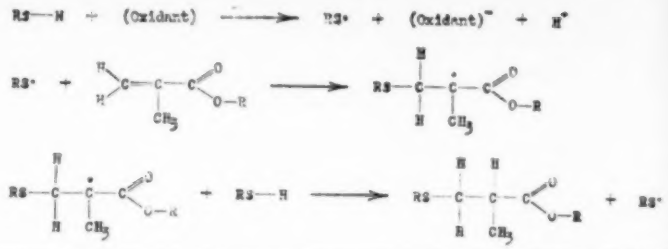
Commercial Metazene is offered in the form of 40% and 80% solutions; deodorized kerosene being used as the solvent. The kerosene is left in to simplify manufacturing processes and also because it inhibits the polymerization reaction initiated by oxygen

when it contacts Metazene. During 1959 a more perfectly inhibited 99% solution of Metazene was made available. This material is of special interest to those who wish to use diluents other than deodorant-grade kerosene.

The deodorizing ability of Metazene is said to stem from several mechanisms.[30] It is interesting to note that a complete elimination of odor is not obtained, but rather a reduction of odor in the order of 80% to 90%. This suggests a type of equilibrium process, wherein the odorous chemical is held by chelation, hydrogen bridging, dipolar attraction, or simple solution with the development of van der Waal's forces. These effects may take place in the gas phase in some cases. More permanent links between Metazene and the odorant molecules result during the polymerization process, with the odor either being linked to the chain if it is reactive enough, or else becoming occluded within the growing polymeric maze.

When a Metazene formulation is sprayed, the deodorant molecules undergo a condensation classified as "Vinyl Polymerization." This reaction may be initiated by the traces of peroxide usually present in Metazene, by oxygen or ozone, radiation, heat, or even by the violence of the physical and thermal upheaval that accompanies normal spraying. The polymerization is considered to proceed by a free radical mechanism. Many odorous substances will react as chain-transfer agents during the polymerization process. For instance, a molecule of thiol may combine with one polymer radical to stop its growth, and at the same time create a radical which may start the growth of a second polymer.[66]

A very similar mechanism that contributes to the deodorizing properties of Metazene involves the non-Markownikoff addition of maladorous molecules to the deodorant. Under the influence of oxygen or other oxidants many stenches will react reversibly to form free radicals. These radicals then attack Metazene at the end of the vinylic double linkage which has the greatest electron density. For example:



The attack generates the more stable Metazene free radical; the preferred form being that in which the free electron resides at the tertiary carbon atom.

Several important generalizations can now be made as a result of these theoretical treatments. Lauryl acrylate, for instance, is undoubtedly inferior to lauryl methacrylate as a deodorant because only a secondary carbon atom is available as a site for the free electron. This makes the radical less stable and harder to create, thus limiting the ability of lauryl acrylate to react with the free radical forms of odorous materials.

On the other hand, if an ethyl group were to be substituted for the methyl group, the resulting lauryl ethacrylate should provide a greater degree of odor control than Metazene itself. This would be due to the increased stabilizing effect of the ethyl group on the free radical, because of its higher electron-acceptance rating. However, if this idea were carried to excess by substituting still higher groups, such as tertiary butyl or phenyl groups, the resulting free radical would become extremely stable — so stable, in fact, that it probably would *not* react with additional odor molecules in order to perpetuate the chain growing process.

It is also possible to replace the alkoxy (—OR) group with hydrogen or other substituents of comparable electronegativity. In the case of hydrogen sustitution, which forms the aldehyde, the shielding influence of the large alkoxy group is lost and the molecule becomes exceedingly active. It also becomes water soluble to some extent and thus odoriferous in its own right (unless used sparingly).

The more reactive odors are controlled most effectively by Metazene. This can be explained on the basis of electronegativity theory. Stenches possessing a region of unusually high negativity in the molecule will react more readily with the Metazene structure. For the amine series this can be demonstrated with the following compounds:

NH_3 > $CH_3{\cdot}NH_2$ > $(CH_3)_2NH$ > $(CH_3)_3N$ > $(C_2H_5)_3N$ > $CH_3CO{\cdot}NH_2$

Most Electronegative	Least Electronegative
Most Odoriferous	Least Odoriferous
Most Reactive	Least Reactive

Similar relationships can usually be established for sulfur, selenium and phosphorus compounds which carry osmophoric centers in the molecule.

A typical air freshener may contain 2.0% Metazene. If this aerosol is sprayed into a room having a volume of 1,000 cubic feet, at the rate of 1.08 gram per second for 10 seconds, the final concentration of Metazene in the air should be 2.0 ppm. In actual practice this figure is reduced because some of the Metazene polymerizes, much of it is locked up within air-borne liquid particles, and because of uneven distribution throughout the room. Taking these additional factors into consideration, it appears that the average effective concentration of Metazene is in the order of 0.05 to 0.50 ppm.

Because of this very low concentration, Metazene or any other true air deodorant *must* have the ability to combine with only the more reactive odors. By this selective action, the deodorant will then remove only the most intolerable ingredients from

a huge preponderance of total odor, causing a reduction in odor far in excess of that which would be expected on the basis of concentration alone.

Although its deodorizing properties were recognized in 1950, manufacturing problems involved in the full scale production of Metazene made it necessary for the aerosol industry to wait until 1953 before a steady supply of high quality material became available. Intensive research programs were then required before the deodorant could be marketed in aerosol form. These investigations covered the evaluation of performance against standard malodorous materials by the jury-panel technique. Later on, exhaustive tests were made to cover such things as dermatological and toxicological aspects, fire hazards, propellant composition, detrimental action on surfaces, and storage stability.[42] No problems were encountered with Metazene when it was properly formulated into "neutral" deodorants,[43] but with perfumed products trouble usually resulted.[44]

It was quickly found that Metazene either killed or drastically reduced the effect of many perfume ingredients, particularly unsaturated aromatics, because of addition or polymerization reactions within the aerosol container. A number of quiet aldehydes, simpler alcohols and esters were specifically tested and found to be compatible. As a result of continued research, most perfume concerns are now able to provide a line of fully tested fragrances for use with Metazene products. Fleeting, floral blends have been the most popular. The perfume concentration is adjusted to make the scent refreshing but not too distinctive.[45,46]

The published formulations for Metazene aerosols have been passed down from the early investigations of such firms as the Boyle-Midway Division (American Home Products, Inc.), the Fuller Brush Co., and others. Major variations have lagged because of the testing difficulties involved. Typical published suggestions are presented as follows:

Ingredients.	I.	II.	III.	IV.	V.
Metazene (100% Basis)	2.5%	2.0%	1.6%	1.6%	1.5%
Perfume	1.0%	—	1.0%	1.5%	0.5%
Emcol E-607 Quaternary Salt	—	—	—	0.1%	—
Deodorized Kerosene	11.5%	13.0%	12.4%	11.8%	—
1,1,1-Trichloroethane	—	—	—	—	49.0%
Propellant-11	42.5%	42.5%	42.5%	42.5%	—
Propellant-12	42.5%	42.5%	42.5%	42.5%	49.0%
References	(47)	(39)	(33)	(33)	(48)
Year Published	1959	1958	1958	1958	1959

More modern trends indicate a preference for Metazene at the level of 2.0%. Odorless mineral spirits replaces the more odorous kerosene based distillates. If perfumes are included, the formula may then also contain a trace of bactericidal material. Upon occasion, a small amount of isopropyl myristate may be added in order to suppress the haloid odor of the propellants. It is also claimed to reduce irritation due to the active ingredients. A small portion of hydrocarbon propellant may be used for economic reasons. Finally, the addition of up to 23% methylene chloride has been claimed to improve the action of the package. A pair of typically suggested formulations are given below:

Ingredients.	VI	VII.
Metazene (100% Basis)	2.0%	2.0%
Light-Bodied Perfume	0.2%	0.3%
Emcol E-607 Quaternary Salt*	—	0.1%
Isopropyl Myristate	—	0.3%
Odorless Mineral Spirits	17.8%	17.3%
Methylene Chloride	20.0%	10.0%
Propellant-11	13.0%	24.0%
Propellant-12	47.0%	36.0%
Iso-butane (Comm.)	—	10.0%

* Or any comparable quaternary salt.

The container used for Metazene formulations may be either plain tinplate or lacquer lined. Valves with buna gaskets may be used as a general rule. Weight losses range from 0.1 to 0.2 Av.oz. per year depending upon the formulation and style of container. A recent examination of plain cans packed with a neutral Metazene formulation showed that some detinning takes place at room temperature. Otherwise the cans looked good after two years in storage.

Meelium as a Deodorant

THE deodorant "Meelium" was introduced in 1951[49] and has been used steadily since that time in a variety of air fresheners. It is a deep red-brown liquid, of moderate viscosity, having a faint citrus type fragrance. A comparison of the physical properties of Meelium with those of other deodorants is given in the following table:

The primary constituents of Meelium are neutrallized hydro-aromatic sulfonates, derived from petroleum.[50] The remaining components are unsulfonated hydrocarbons, sodium sulfate, and water. Meelium is quite viscous in the undiluted state, so it has been merchandised as a 60% solution in deodorized kerosene for easier handling. By removing the water from pure Meelium, the remaining material becomes a hard, glassy mass.

There are at least two reactive regions in each Meelium molecule, of the hydroaromatic sulfonate type. These are shown by the following general structures:

The "R" groups have a moderate

Specific Properties for Meelium and Metazene

Property.	*Metazene* (99%)	*Metazene* (80%)	*Metazene* (40%)	*Meelium* (60%)	*Meelium* (100%)
Specific Gravity; 20° C.	0.970	0.900	0.863	0.911	0.999
Refractive Index; 25° C.	1.4453	1.4428	1.4401	1.4650	1.4916
Color	Amber	L. Amber	L. Amber	Brown	Brown
Boiling Point (or IBP)	522° F.	———	———	384° F.	> 600° F.
Melting Point	6° F.	———	———	(1)	(2)
Flash Point	> 285° F.	217° F.	156° F.	195° F.	336° F.
Acid Number	0.417	0.371	0.324	0.317	0.648
pH Value	4.0	4.1	4.35	6.5	6.6
Viscosity; 25° C. in cps.	49.0	—	—	103.5	452.0
Optical Rotation	0	0	0	0	0
Moisture Content	0.051%	0.042%	—	4.99%	8.46%

(1) Viscosity about 100,000 cps. at —25° F.
(2) Viscosity about 500,000 cps. at —25° F.

degree of complexity and may be connected at bridgehead positions.

Although a reduction in the size of one or more Meelium "R" groups might be expected to lead to a more reactive group of compounds, a concomitant decrease in chemical stability takes place at the same time. In one instance this led to the formation of tar-like polymeric materials. Conversely, the use of larger "R" groups should tend to dilute the active centers and create compositions of inferior deodorizing power. As in the case of Metazene, the Meelium structures have been chosen so that the distressing effects of these extreme conditions are minimized.

The Meelium molecule is thought to contain two or more regions which bear a close structural similarity to the reactive portion of Metazene, plus at least one area which carries a sort of "frozen" styrene structure. Each of these configurations is considered to assist in odor control. The reactions probably involve both addition reactions and chain-transfer polymerization. The pseudo-chemical effects of van der Waal's forces and bridging mechanisms also participate in the deodorizing process.

SINCE Meelium is thought to operate against odors by essentially the same methods as Metazene, there is no point in a repetition of the theoretical discussions already cited. It should be recognized, however, that the complexity and somewhat variable composition of the Meelium sulfonates makes it impossible to define the importance of individual structures or reaction mechanisms to the total deodorizing activity. The constructions are necessarily based upon generally accepted theories[51] of organic reactions. Reaction intermediates may never be isolated. Certainly the degree of acidity, special steric configuration, type odorant to be destroyed, and a number of factors specifics to one given situation will be the governing influence of reactions carried out in actual practice.

The deodorizing ability of Meelium has been confirmed beyond any real doubt. Tests have shown that as little as 0.1 ppm. of the deodorant completely eliminates the repugnant odors of cigar smoke, fried onion, boiled cabbage, decaying fish, putrid chicken intestines, and limburger cheese.[50] In one instance a boiled cabbage odor returned, greatly diminished, after initial deodorization of a test chamber. This was finally explained by the fact that some of the odorant had collected as a dew on the walls, later evaporating to restore a fraction of the original smell.

Other test work has been reported to show that Meelium has a very low toxicity rating. These investigations describe the results of gross pathology and histopathologic studies which were made on white rats exposed to Meelium by both chronic feeding and repeated treatments with an aerosol mist. No ill effects were noted at any time during the fourteen week test period.[52]

Meelium is incompatible with a number of perfume ingredients, particularly the terpenes and similar unsaturated aromatics. Water can also be a problem. Meelium will normally carry about 8.3% water on a 100% active basis. When Meelium is used at the rate of 1.6% in the aerosol, water then forms about 0.1% of the complete solution. Either all or nearly all of this water is solubilized, depending upon the nature of the diluents, because of the coupling agents also present in Meelium. At worst, only a half drop or so of water will float on the aerosol solution, and this has never been a cause for alarm. However, the very fact that a significant amount of water is present should be kept in mind during the selection of perfumes. The so-called "water-resistant" perfumes are preferred.

Neutral Meelium deodorants are inclined to leave a slight sweetish chemical odor in the air and consequently have found limited commercial acceptance.[53] They may be acceptable for institutional use. The present Meelium air fresheners contain from 0.008% to 0.250% perfume. Floral, pine, spice and many other fragrances have been used with success.

The published formulations for Meelium aerosols have come down from the early investigations by two concerns during 1952 and 1953. As with Metazene, major improvements have lagged because of the magnitude of the testing programs which would be necessary to prove the merits of such variations.

The suppliers of Meelium recommend the use of an 8.0% solution of deodorant in a deodorized kerosene base. Perfumes and propellants are then added to complete the aerosol formulation. Since the deodorized kerosenes are often far from odorless, there has been a trend toward the use of odorless mineral spirits as a diluent. This is of particular importance when the perfume level is rather

Typical Meelium Formulations

Ingredients.	VIII.	IX.	X.	XI.	XII.
Meelium (100% Basis)	1.2%	1.2%	1.5%	1.6%	1.6%
Perfume	0.5%	0.1%	0.5%	0.2%	0.3%
Deodorized Kerosene	13.3%	13.7%	—	18.2%	18.1%
1,1,1-Trichloroethane	—	—	49.0%	—	—
Propellant-11	42.5%	42.5%	—	40.0%	40.0%
Propellant-12	42.5%	42.5%	49.0%	40.0%	40.0%
References	1959	1958	1959	1958	1956
Year Published	(47)	(41)	(48)	(41)	(50)

low. No history is available to show whether auxiliary deodorizers, such as the quaternary salts, would be desirable. Methylene chloride and 1,1,1-trichloroethane have been used successfully in amounts up to at least 20% as a replacement for Propellant-11. Special revisions in the formula must be made before the hydrocarbon propellants can be included.

Two suggested fomulas for modern Meelium air fresheners are:

Ingredients.	XIII. *(Domestic).*	XIV. *(Institutional).*
Meelium (100% Basis)	1.5%	2.0%
Perfume	0.3%	0.1%
Odorless Mineral Spirits*	18.2%	17.9%
Methylene Chloride	20.0%	15.0%
Propellant-11	13.0%	20.0%
Propellant-12	47.0%	45.0%

* Or distillate of comparable quality.

Meelium deodorants have been merchandised in both plain tinplate and phenolic lined cans. The use of plain cans should have the backing of results from adequate storage tests with at least some cans being checked at 100°F. In some instances mild corrosion problems have developed, but only after extended storage. Valves with buna gaskets are suggested in general. Weight losses are in the order of 0.1 to 0.2 Av.oz. per year depending upon the formula and dispenser.

The Dual Role of Perfumes

Nearly all air fresheners contain at least a small amount of perfume. In fact, a very large portion of the entire market is held by products which use perfumes as the sole means of combating odor. In many of them the perfume plays a double role. Certain natural perfume ingredients react as true chemical or physiological deodorants, while others simply create a pleasing fragrance.

The deodorizing ability of perfumes comes mainly from the substitutive and complexing action of certain aldehydes and esters. Examples of compounds which have the special structural groupings necessary to reduce odors are geranyl butyrate, terpene aldehydes, methyl anthranilate, methyl nonylaldehyde (lime), styrolene acetate and certain methylated heptanaldehydes.[55] Many of these deodorants are selective; isocoriandral,[56] and the ionones, for instance, are specifics for isopropanol odors, while citrus oils are widely used to overcome the odor of urine and medicinals. Certain polycyclic musks and aromatic aldehydes are said to suppress sulfide stenches by a combination of chemical deodorization and olfactory anesthesia.

A range of up to 3,600 natural and synthetic raw materials is available to the perfumer,[57] and a single fragrance may be compounded with as many as a hundred of these oils. The deodorant perfumes are usually made by selecting one or two deodorizing materials which are known to be compatible with the fragrance being sought, and then adding the other ingredients and testing, until the final fragrance is achieved. A further test involves the long-term stability of such perfumes in order to see that no slow reactions are taking place between the deodorant oils and the other ingredients.

Since many deodorizing compounds are effective at concentrations as low as 10 ppb. in air, an aerosol need theoretically contain only 0.01% of deodorants in order to control odors. In practice the amount is higher; around 0.05%. In many cases it is possible to intensify the deodorizing powers of a given perfume by using special processing methods,[28] or by adding certain activating ingredients.[58]

Commercial perfume-based air fresheners run the gamut from those which deodorize in vanishingly small degree to those which are extremely effective. Because it is often difficult to point out the specific ingredients which do the deodorizing, perfumes which have deodorant properties are often called masks, neutralizers and similar appellations of little connotational value. One unfortunate result of this relaxed terminology is that most perfume air fresheners are looked upon as re-odorizers, and are claimed to work by merely overpowering the original odor with a new one that is more pleasant. While this may be true in some cases, it recalls the parallel situation in the insecticide industry, where the inadequate and stigmatic term "bug bomb" is still used to describe modern products.

The problems of adapting perfumes to aerosol spray packages have been discussed in tremendous detail. Perfumes can be generally described as complex, polar aromatic materials. By using the broad rules of solubility, it is apparent that they will resist solution by the low molecular weight, non-polar liquids that are usually a major part of air-freshener solvent-propellant systems. Ethanol, isopropanol and Propellant-11 are fairly polar, and because of this they dissolve most perfume materials. Methylene chloride is also a good solvent. At least one of these polar type solvents must be present in every air freshener.[59]

The degree to which a perfume dissolves depends upon both the solvent system and the nature of the ingredients in the perfume itself. As a rule, sufficient Propellant-11 will be present to ensure easy solubilization of most fragrances. If alcohols are used, so much the better. Yet even under the most optimistic conditions a few resins and unusual compounds will resist solution. Hydroxycitronellal, for instance, is almost insoluble in even the more favorable air freshener solutions.

Because of these miscibility problems air fresheners are often produced by the single stage refrigeration method. All the aerosol ingredients are mixed together in a pressure tank, then cooled to about —25°F. and metered into cans. In practice, the mixing program is arranged so that the perfume insolubles are given at least two hours to coagulate. On the way to the filling machine the solution is passed through a medium grade filter and then refrigerated. The chilled liquid is finally polished by means of a close grain filter before it is filled into cans.

Unless a polar solvent, such as alcohol, is made a part of the active material it will be mandatory to produce the air freshener by the single-stage method, thus taking advantage of the solvency of Propellant-11. Perfumes are usually insoluble in deodorized kerosenes and similar distillates. In addition, they are sometimes partitioned by glycol solutions with the separation of certain ingredients. By the addition of methylene chloride to the petroleum distillates, and by including either ethanol or isopropanol with the glycols, these solutions can be transformed into good solvents for most perfumes. Formulations of this type can be filled not only by single-stage methods, but also by double-stage refrigeration or by pressure loading techniques. Double-stage refrigeration filling can be done if the active solution is stable down to about —25°F. without the separation of any of the ingredients or without the solution becoming too viscous. In both procedures the active materials are placed in the can and then the propellant is added in a separate operation.

The double-stage methods also suffer from the limitation that perfume ingredients are sometimes thrown out of solution when the propellant is added. No provision can be made against this eventuality, except by pre-testing the formula for perfume compatibility. Special glass aerosols or pressure tubes are available in which the complete formula can be prepared. As a rule, the solution is allowed to stand at least overnight at room temperature, and is then checked to see if any precipitation has taken place.

The odor stability of perfume materials is said to be *more critical* in an aerosol than in any other packaging medium. A few essential oils are sensitive to Propellant-12 and many are adversely affected by Propellant-11. The chemistry involved in these changes is still rather vague, but it is known that the presence of even minute traces of moisture will greatly accelerate the decomposition of many perfumes in contact with these propellants. Most aerosol solutions have low viscosities — in the order of 5% of that of ethanol, for instance — and it may be assumed that the enhanced mobilities of aerosol ingredients act to speed up any reactions that are capable of taking place between them.

Whenever alcohols, glycols or methylene chloride are made part of an air freshener formulation, it is prudent to use a lined container and valve cup. If simple de-tinning takes place, no great harm will be done as a rule. But actual surface corrosion brings iron into the solution and this nearly always causes some degree of perfume degradation, change in pH value, and build-up of a metallic or alliacious odor,[60] all of which are quite undesirable. Under the apparent catalytic influence of polyvalent ions and free radical chain initiators,[120] ethanol is slowly changed into acetaldehyde, which then further reacts to give the diethyl acetal. These two chemicals have a sweet, pungent odor that can be very powerful.[61]

A GREAT many essential oil ingredients must be left out of the perfumes used for air fresheners. Most of them are found to be either esters or aldehydes; particularly those activated by conditions of unsaturation, conjugate unsaturation or alkyl branching. These are the same compounds used to destroy odors, and only in some cases, with careful compounding, can they be made a part of perfumes. As a rule the more reactive aldehydes and esters clash with the other perfume ingredients; especially under the labilizing influence of aerosol solvent systems. Reactions involving transesterification, partial hydrolysis and acetalization can all be expected to have disastrous effects upon the final perfume aroma.

In actual practice, the harsh aliphatic aldehydes are rarely used in perfumery. Citral, citronellal and hydroxycitronellal are examples of aliphatic aldehydes of intermediate size and sensitivity. They are used in fruity, citrus type perfumes, and it follows that fragrances of this type must be very carefully checked for odor stability.

The necessity of eliminating many mates, butyrates, valerates and other esters often poses a real problem to the perfumer. For deodorizing combinations one or two of these reactive esters may be left in, with the remaining bland items being selected for compatibility as well as for an overall harmonious effect. In certain instances it has been found that the deodorizing aldehyde or ester has limited stability when compounded with the perfume oil, and must therefore be added to the aerosol formulation on a separate basis. The dilution factor appears to be the dominant one in controlling stability —particularly for aldehydes.

Irritation is another consideration applied to perfumes. Benzyl benzoate and many other heavy substantive oils and resins cannot be used in air fresheners because of their intense irritating action on the mucous mem-

(*Continued on Page* 58)

Typical of the South African products is this array, which includes a number of U.S. brands.

Aerosols in South Africa

By A. Mans
Factory Manager
Aerosol Co. of South Africa (PTY) Ltd.
Durban, South Africa

THE market for aerosols in South Africa, which is still growing, is mainly concentrated in the major population center of Johannesburg. However, most of the aerosols are manufactured in Durban by the Aerosol Co. of South Africa (Pty) Ltd. and Robertsons (Pty) Ltd., the latter a filler-marketer and the former strictly a contract loader.

The principal reason for this concentration of aerosol manufacture in Durban is the necessity to import the fluorinated hydrocarbon propellants, which are not produced in South Africa.

Apart from the two companies mentioned above, the two other loaders of importance are A.M.S. and Delta Associates, both in Johannesburg. These companies fill mainly their own products, or products manufactured for their associates.

In contrast with Europe, progress in the aerosol industry in South Africa was very rapid from the end of 1955 (when the Aerosol Co. of South Africa first commenced operations) until early 1958 when development more or less steadied. In 1958 something occurred that may be unique for South Africa. There was an aerosol "recession" owing to the fact that too many companies went into the market following the great success of pressurized packages during the previous year.

In 1959, the sales of aerosols are estimated to have been as follows:

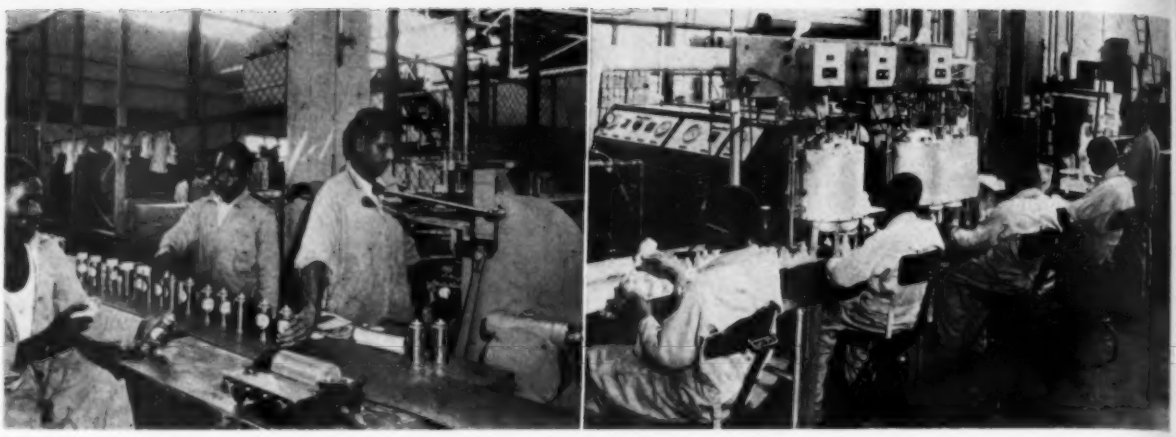
Insecticides	1,050,000
Hair Sprays	225,000
Colognes	95,000
Toothpaste	90,000
Other Cosmetics	150,000
Paints	350,000
Miscellaneous	60,000
Total	2,020,000

Since the potential market so far consists of only the three million Whites in South Africa, practically the only purchasers of aerosols, this volume can be considered good.

ORIGINALLY, insecticides contained a high percentage of propellants and had at least .1% synergised pyrethrins or the equivalent knock-down value. However during the past year the insecticide market has been considerably extended by the introduction of a low-percentage propellant formulation containing 45% propellant 12 and a smaller active insecticide content of, in most cases, .05% synergised pyrethrum. Introduction of this formulation, with its smaller percentage of imported propellants, has permitted a considerable reduction in the retail price of these insecticides—even though the content of the cans is 14 ounces compared to the former 12 ounces.

One interesting feature of South African insecticides is that from the beginning they were perfumed with pleasant, carefully selected Dutch, German and other perfumes, following the European trend rather than the 1946 U. S. example of marketing improperly perfumed formulations. This

Exterior view of plant.



Labeling is done on a hand-operated unit, while filling and crimping is semi-automatic.

definitely has been a major factor in the rapid growth of the South African aerosol market.

The latest addition to the insecticide product line is the Midget Aerosol with a metering valve which, contrary to expectations, appeared to be successful as soon as it was introduced.

Another popular aerosol is hair lacquer, and most of the well-known American and English brands are made and sold in South Africa. Strangely enough, neither room deodorants, shave creams, or toothpastes have had the impact on the market they have in the United States. Also unaccountably, suntan lotions have not sold anywhere near the relative quantities they have in Europe.

Although the buying power is there, the South African does not spend his money lavishly on aerosols unless there are marked advantages from an application standpoint (as is the case with paints and hair lacquers). Paints, mainly produced by A.M.S. (which is connected with a U. S. firm) are selling exceptionally well.

Cans made with a drawn aluminum body and a tinplate bottom are produced domestically by Metal Box S.A., an affiliate of the well-known British can manufacturer. However, the majority of containers used in South Africa are entirely tinplate and are imported from the U. S. and Britain.

There are no aerosol valves made in South Africa at all. Most in use are Precision, Aerosol Research, and Newman-Green valves, while for bottles Risdon valves are used. All of these are of American manufacture.

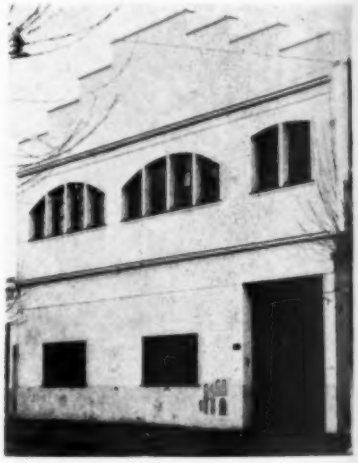
All the aerosol bottles are plastic coated and come, in the main, from Wheaton. The quality of these bottles is very good, as opposed to some of those used on the Continent, and some extremely attractive types have been introduced.

Filling equipment is mostly semi-automatic or manual. Some cold filling lines are made domestically but most equipment has been imported from the U. S., Switzerland, and Britain. The first filling operation, which commenced in 1955 was with a semi-automatic Aeratom pressure filler. This unit is still in good working order without having had major repairs, and is used for trial runs.

Although it is very difficult to predict the future for such a capricious product type as the aerosol (where the imagination and driving energy of one person can initiate a new sales impulse) the aerosol market in South Africa appears to be largely stabilized —at least so far as the white population is concerned. Completely unexplored however, is the market for the non-white population, which seems to appreciate the magic of the push-button package, especially if modern perfumes are used in the formulations. There would appear to be good prospects for the aerosol among the non-white population, particularly in the mining areas where the necessary buying power is available.★

Givaudan Builds in Argentina

Pilot plant production has just been started in the new factory of Givaudan Argentina S. A., newest



manufacturing member of the international Givaudan organization. Givaudan Argentina S.A. was organized in 1955 to service the expanding soap, perfume and cosmetic industries of the Argentine. The new plant will be located in the town of Gutierreza, 20 miles from the Argentine capital, on the River Las Conchitas. The site is some 30 acres in size.

In the village of Bernal, a suburb of Buenos Aires, compounding and research operations are already being conducted in a modern building (photo above) owned by the company. Here, all compound requirements of Argentine customers can be fulfilled with allowances for future expansion. An analytical control laboratory is also nearing completion.

Aerosol Products are featured at *Hardware Show*

DuPont's "Slipspray" and Osrow Products combination sale were two of the highlights of the show.

AEROSOL products, not too long ago in scarce evidence at the National Hardware Show, this year were shown in more booths than ever before in the show's history. Held at the New York Coliseum from Oct. 10 through 14, the sell-out show drew an estimated 45,000 hardware retailers, jobbers, and wholesalers.

From the standpoint of volume and number of products displayed, last year's leaders, Lenk Manufacturing Co. (Franklin, Ky.), Seymour of Sycamore, Inc. (Sycamore, Ill.), Sheffield Bronze Paint Corp. (Cleveland), Dupli-Color Products, Inc. (Chicago), California Spray Chemical Co. (Haddonfield, N. J.), and Lynwood Laboratories, Inc. (Norwood, Mass.) continued among the leaders from the standpoint of aerosol emphasis and variety of products. But at the same time a new group of marketers entered the show with just as strong an aerosol emphasis. Osrow Products, Inc. (Glen Cove, N. Y.), Hue Chemical Co. (Brooklyn), Illinois Bronze Powder Co. (Chicago), were typical of the newer entries with strong aerosol exhibits. One of the major marketers, the Consumer Products Division of E. I. du Pont deNemours & Co. (Wilmington) keyed its entire booth around a new dry spray lubricant "Slipspray", and featured a huge revolving "Slipspray" container.

But aside from the completely aerosol exhibits, probably the most impressive feature of the show from the viewpoint of the aerosol industry visitor was the huge number of displays with one or a small number of aerosol products among the many conventional products the company customarily shows at such exhibits. Typical of this type of exhibitor this year was Camp Chemical Co. (Brooklyn, N. Y.), Boyer Chemical Co. (Evanston, Ill.), Desmond Bros. (Alliance, O.), Nip-Co. Manufacturing, Inc. (New Rochelle, N. Y.), W. J. Ruscoe Co. (Akron, O.), The Upson Chemical Corp. (Lockport, N. Y.), The Renard Co. (Mount Vernon, N. Y.), Aceline Products Corp. (Rochester, N. Y.) and Thermwell Products Co. (New York).

In brief, here is a list of the aerosol exhibitors with a short description of the products shown:

1. *Lenk Manufacturing Co.*—A new windshield de-icer, called "Sleet-Free", which will retail at 99 cents, plus its fire extinguisher.

2. *Seymour of Sycamore, Inc.*—The new line of "Quick Dry Vinylized Enamels", which are reported to dry in minuutes.

3. *Sheffield Bronze Paint Corp.*—A complete line of paints.

4. *Dupli-Color Products, Inc.*—A complete line of spray enamels, all in new lithographed cans and all equipped with the company's "Spra-Lok" tamperproof cap. Also shown were seven new aerosol automotive specialties: "Battery Terminal Coating", "Ignition Spray", Degreaser and Motor Cleaner", "Chrome Protector", "Rust Dissolver", "Paint and Varnish Remover", and a "Fire Extinguisher". All of the latter will retail at $1.49.

5. *California Spray Chemical Co.*—aerosol insecticides, for both flying and crawling insects.

6. *Lynwood Laboratories, Inc.*—a wide range of insecticides and herbicides including the "Hornet Jet Bomb", the "Walk 'n Weed", the "Ivy Bomb", "Shoo-Fly Non Allergic Bomb" (and a non-toxic bomb) "Shoo Fly Moth Proofer", "Hari Kari Flower Bomb", "Savadog Flea Bomb", "K-9 Kop Dog Repellent, and "Sport Insect Repellent". Among the household products is "Fabul-X" all metal cleaner and a dri-cleaner for walls. And finally, the company showed its "Safe-Air" deodorant-disinfectant and a new starch product.

7. *Osrow Products*—"Spray Slip" silicone lubricant and "Release", a penetrating oil, which are being sold in combination (with a screwdriver) for $2.98.

8. *Hue Chemical Corp.*—a line of spray enamels, plus "Hi-Shine" shoe polish, "Starch Queen", "Let it Snow", a de-icer, and "Citru-Cent", a room deodorant.

(*Continued on Page* 54)

AEROSOLS in review

A summary of aerosol articles in other publications

"Old-Line" Perfume Houses Happier With Aerosols

FOR AN evaluation of the impact of aerosol packaging on the fragrance industry, undoubtedly the most dramatic of recent contributions has been an article called "The Marketing Picture in Aerosols," written by Arnold C. Ropeik, in the September issue of *Beauty Fashion*. Correctly terming the whole situation a "struggle between packaging and convenience as against tradition and quality," the author concludes the aerosol is here to stay—despite the fact it is still "in its infancy."

"As in anything new," Mr. Ropeik writes, "some firms have held the line and have been drawn into aerosols very little, if at all. Primarily these are firms tightly controlled abroad. They feel, said one buyer, that this is still in the gimmick stage. They are strong in old-line tradition. But statistics indicate that, one by one, they are moving into the field, however reluctantly. This, perhaps, is the strongest indication that the aerosol is going to be a success in the fragrance field.

"Summing up statistically:

"1. Of the higher-priced lines, about 70% now have one form or another of aerosol colognes.

"2. Only about 15% of the higher-priced lines are in perfume aerosols.

"3. In the medium-priced range, a strong 80 to 85% of all firms are in aerosol colognes and toilet waters. Again about 15% are in perfumes.

"4. The average price of the aerosol market today is about $5. Prices range, in colognes and perfumes, from $1 to $10, but the key price is $5 where most of the popular products are traded."

The *Beauty Fashion* article next sums up from the standpoint of past marketing performance and future hopes:

"1. A company must offer a good product, advertise it well and improve the packaging each year. The experts see the packaging and promotion as 95% of the sales battle. Promotion as spoken of here is not only the massive all-media advertising campaign, but also personable and instructively forceful selling over the counter.

"2. The price range will remain about the same. Few believe that the really expensive straight perfumes will ever go into the aerosol field. They feel that a woman may be willing to exert a heavy 'trigger finger' on a cologne or toilet water, and even a small purse aerosol perfume, but will be reluctant to hear $40 worth of perfume come whooshing out of an aerosol package. Further, the personal or fingertip touch given to the expensive perfumes would somehow be lost in the mechanical manipulation of an aerosol trigger.

"3. Aerosols will become an ever-increasing factor in the gift fragrance market. Women will buy them for themselves, and men will go to aerosols more and more as gifts for the lady fair. The male, being more of the do-it-yourself type, is made to order, say the salespeople and buyers, for aerosols."

Mr. Ropeik predicts that in the future aerosol packages will be improved even further. He predicts that lightweight metals will be imbued "with every color and combination imaginable." He suggests that many new shapes and sizes in glass and metal containers will be marketed, and that "the marriage of perfumes and propellants appears destined for a long and profitable life."

•

A REPORT on extensive tests of the performance of aerosol germicides is featured in the September issue of *Soap & Chemical Specialties*. Written by Eleanore S. Wright and Robert F. Prindle of the research laboratories of Lehn & Fink Products Corp., it is concerned mainly with the mechanics of setting up the tests, and of the steps necessary to insure a valid reading of the test results. Of three aerosols tested, only one (of an unspecified formulation) was judged to have good germicidal activity with both gram-negative and gram-positive bacteria.

•

LARGE-SCALE conversion of unstable kerosene emulsion into a stable, viscous gel suitable for aerosol packaging was accomplished at the plant of Peterson Filling and Packaging Co. through use of a homogenizer, reports the July issue of *Chemical Processing*. In an article based on an interview with Peterson Filling's research director, Montfort Johnsen, the magazine notes that the homogenizer produced a material with higher viscosity and better stability than could be produced with laboratory apparatus. The kerosene

(*Continued on Page* 68)

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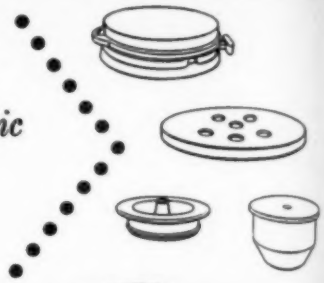

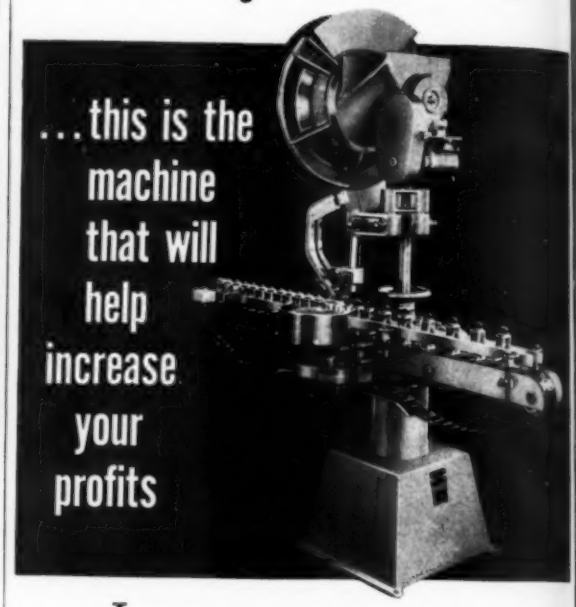

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Non-Aqueous Aerosol Foams

By P. A. Sanders†

"Freon" Products Laboratory
E. I. du Pont de Nemours & Co., Inc.
Wilmington, Del.

AQUEOUS aerosol foam products have been marketed since early 1950. As a result of their utility and appeal, these products have grown in volume until they constitute one of the major groups of aerosol products. Aerosol shaving lather is the best known aerosol foam product, but there are many other materials marketed as aerosol foams, such as shampoos, pharmaceuticals and glass cleaners.

Aqueous foams may have some disadvantages, however. These foams have limited stability, since water evaporates relatively rapidly. In some cases, active ingredients may not have sufficient solubility in the aqueous phase. Also, there is always the possibility of corrosion from the water present.

Nonaqueous foams may, therefore, be useful for many applications. These foams are prepared with polyhydric alcohols such as glycerine and glycols, or with glycol derivatives, in place of water. Extremely stable foams may be prepared because the glycols evaporate very slowly. The nonaqueous foams should be particularly applicable to pharmaceutical and cosmetic products, such as vaginal foams, suntans, burn ointments and antiperspirants. In such formulations, the longer foam stability and possibly better solubility of some active ingredients, may be factors of considerable importance.

In appearance, the foams obtained from the nonaqueous systems resemble the aqueous foams from typical aerosol shaving lather formulations. The characteristics of the foams from nonaqueous systems may be varied widely to suit any particular application, depending upon the choice of surface active agent, the type of propellant, and the type of glycol or polyhydroxy compound as the base. Foam stability, for example, may be varied to obtain quick-breaking foams or foams with high stability. Likewise, such properties as foam density and wettability may be varied at will.

The more stable foams from the nonaqueous systems appear to have a greater consistency than the aqueous shaving lather foams. In some cases, nonaqueous foams may approach creams in their consistency. Microscopic examination of such foams indicates that the cell structure appears to be smaller and much more uniform in size than that of the aqueous foams.

The glycols or glycol derivatives used as the base for the nonaqueous foams have relatively low volatility. Therefore the foams from such systems do not dry rapidly. This must be borne in mind when formulating products with the nonaqueous systems.

The properties of the foams from nonaqueous systems are a function of the type of glycol or glycol derivative, the type and quantity of propellant, the surface active agent, and the other additives that may be present. These factors are discussed in the following sections.

I. Variation in Glycols

On the basis of the overall characteristics of the emulsion system, such as foam stability, emulsion characteristics, product discharge and toxicity, the preferred glycols for the nonaqueous foams are propylene glycol and polyethylene glycol 200 or polyethylene glycol 400.

A. Foam Stability

The ability of a glycol to form a good foam with the fluorinated hydrocarbon propellants depends to a considerable extent upon the solubility of the propellant in the glycol. In general, glycols that have the least solubility for the propellants appear to give the best foams.

A number of glycols or glycol derivatives were evaluated for their foam characteristics using a basic formulation of 86% glycol, 4% propylene glycol monostearate as the emulsifying agent and "Freon-12"/"Freon-114"* (40/60) as the propellant. After discharge, the foams obtained from the various glycols were examined qualitatively at in-

† Presented at the third annual convention of the Canadian Manufacturers of Chemical Specialties Association at Montreal on Oct. 25.

* Freon and combinations of Freon and F with numerals are Du Pont's registered trade marks for its fluorocarbon propellants.

TABLE I

EFFECT OF VARIATION IN GLYCOLS UPON FOAM STABILITY

Foam Stability Between 48 and 72 Hours
1, 3 Butylene glycol
Propylene glycol
Foam Stability Between 4 and 24 Hours
Diethylene glycol
Ethylene glycol
Glycerine
1, 2, 6 Hexanetriol
1, 5 Pentanediol
Polyethylene glycol 200
Polyethylene glycol 400
Polyethylene glycol 600
Tetraethylene glycol
Triethylene glycol
Foam Stability Less Than 1 Minute
Diethylene glycol ethyl ether
Diethylene glycol methyl ether
Dipropylene glycol
Polypropylene glycol 150
Tripropylene glycol
Glycols Producing No Foams
Diethylene glycol butyl ether
Dipropylene glycol methyl ether
2-Ethyl hexanediol 1, 3
Hexylene glycol
Polyglycol 11-80
Polyglycol 11-100
Polyglycol 15-100
Polyglycol 15-200

Emulsion System: 86% Glycol, 4% propylene glycol monostearate, 10% "Freon-12"/"Freon-114" (40/60).

TABLE II

EFFECT OF VARIATION IN PROPELLANTS UPON FOAM STABILITY

Propellant	*Foam Stability (Hours)*
"Freon-12"	72
"Freon-12"/"Freon-114" (40/60)	48-72
"Freon-114"	24-48
"Freon-12"/"Freon-11" (50/50)	4-24

Emulsion system: 86% propylene glycol, 4% propylene glycol monostearate, 10% propellant.

TABLE III

EFFECT OF PROPELLANT CONCENTRATION UPON DISCHARGE

——*Composition of Emulsion (Wt. %)*——			
Propylene glycol	*Propylene glycol monostearate (pure)*	*Propellants 12/114 (40/60)*	*Comments*
88	4	8	Excellent discharge and good foam.
90	4	6	Discharge slower than above—good foam.
92	4	4	Almost liquid discharge—expands into a fairly good foam, however.

TABLE IV

EFFECT OF HIGHER PROPELLANT CONCENTRATIONS UPON FOAM STRUCTURE

——*Composition of Emulsion (Wt. %)*——			
Propylene glycol	*Propylene glycol monostearate (pure)*	*Propellants 12/114 (40/60)*	*Comments*
77	8	15	Very coherent foam.
72	8	20	More coherent foam than above—somewhat sputtery discharge.
52	8	40	Very dry foam—sputtery discharge.

tervals to determine if any observable collapse of the foam structure had occurred. The results of this study are given in Table I.

The solubilities of the fluorinated hydrocarbon propellants in glycols and glycol derivatives have been reported in "Freon" Aerosol Report FA-25.[1] A comparison of the foam stability data in Table I with the solubility data for the propellants in glycols[1] indicates that the glycols with the *least* solubility for the propellants, such as propylene glycol, 1,3 butylene glycol, ethylene glycol, etc., give the most stable foams. Glycols that are completely miscible with the propellants or have high foam solubility for the propellants give unstable foams or do not foam at all.

The data in Table I illustrate the wide variation in foam stability that occurs with a variation in the glycol used as the base. The relative stabilities of the foams, however, may be different in emulsifying systems other than the basic one used for the evaluation. Factors, such as the type of emulsifying agent or the type of propellant, conceivably could alter the relationships.

B. Selection of Glycols

The selection of any particular glycol for a given product would depend upon such factors as foam stability, toxicity, solubility characteristics for the active ingredients, etc. Toxicity considerations would be extremely important, particularly for products to be applied to the skin. Compounds such as propylene glycol, glycerine and the polyethylene glycols should be suitable for topical applications, judging by the low toxicities reported for these materials.[2,3,4]

On the basis of toxicity and foam stability, propylene glycol, glycerine or the polyethylene glycols would be satisfactory. However, glycerine has the disadvantage of forming extremely viscous emulsions or gels. As a result, the propellant remaining in the standpipe after pressure filling may not mix with the rest of the formulation during shaking. The initial discharge therefore consists primarily of propellant. Subsequent discharge of the viscous formulation is slow and sputtery. For this reason, glycerine alone does not appear promising as a base. However, it certainly could be utilized in combinations with other materials.

Emulsions prepared with propylene glycol or the low molecular weight polyethylene glycols have relatively low viscosities. This permits easy redispersion upon shaking if phase separation occurs during standing. Likewise, the discharge characteristics of the emulsions are satisfactory.

II. Variation in Propellants

A. Foam Stability

The type of propellant used with the nonaqueous emulsion systems has a considerable effect upon the stability of the resulting foam. This was demonstrated with a number of propellants in an emulsion system consisting of 86% propylene glycol, 4% propylene glycol monostearate and 10% propellant. Foam stability was evaluated by visual observation as described in the previous section. The results of the study are given in Table II. With either "Freon-12"/"Freon-114" or "Freon-12"/"Freon-11" solutions, foam stability increases as the proportion of "Freon-12" is increased, so that the most stable foams are obtained with "Freon-12" alone. Since "Freon-12"/"Freon-114" solutions give more stable foams than "Freon-12"/"Freon-

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11" solutions, the effect of the three propellants in decreasing order of foam stability is: "Freon-12":"Freon-114" : "Freon-11."

Effect of Varying Propellant Concentrations

Concentrations of propellant of 8-10% appear to give the most satisfactory type of discharge and foam. Decreasing the concentration of propellant below 8% has a detrimental effect upon the discharge, as indicated by the data in Table III.

Increasing the concentration of surface active agent to 8% and increasing the propellant from 15% to 40% gives very coherent foams, as shown in Table IV.

Increasing the propellant concentration from 60% to 90% or higher gives a very interesting series of products. These emulsions can be sprayed with a standard actuator or discharged with a foam valve. When sprayed, a product somewhat similar to a cold cream is formed which expands into a very stable foam. With a foam actuator, the product discharges as a cold, dry, frozen foam which expands into a stable foam after warming up. Typical examples of formulations of this type are listed in Table V.

At these high concentrations of propellant, the foams had excellent stability, even at concentrations of surface active agents lower than 2%.

III. Effect of Variation in Surface Active Agents

Among the many variables that affect the properties of the nonaqueous emulsions, the type of surface active agent used is one of the most important. Although a large number of surface active agents were evaluated in the nonaqueous systems, only a few agents were found to be effective. The most satisfactory agent for the emulsions found in this work is self-emulsifying propylene glycol monostearate.

A. Foam Stability

1. *Variation in Type of Agent*

Evaluation of the surface active agents was carried out in a basic system containing 86% propylene glycol, 4% agent and 10% Propellants 12 and 114 (40/60). The agents found to be most effective are listed in Table VI. As the data show, foam stability may be varied from less than one minute to greater than one week by proper choice of the surface active agent. For the most stable foams, propylene glycol monostearate (self-emulsifying) is the preferred agent. Where high stability is not required, other agents could be used. Self-emulsifying propylene glycol monostearate and "Arlacel" 40 are both reported to have low toxicity[6,6] and are used in cosmetic preparations, as is cetyl alcohol. "Duponol" WS is not recommended for topical applications.

TABLE V

NONAQUEOUS EMULSIONS WITH HIGH PROPELLANT CONCENTRATIONS

Composition of Emulsion System (Wt.%)		
Propylene glycol	*Propylene glycol monostearate (self-emulsifying)*	*Propellants 12/114 (15/85)*
66	4	30
19	1	80
8	2	90

TABLE VI

EFFECTIVE SURFACE ACTIVE AGENTS FOR NONAQUEOUS FOAMS

Surface Active Agent	*Foam Stability*
Propylene glycol monostearate (self-emulsifying)	1-2 weeks
"Duponol" WS (fatty alcohol amine sulfate composition)	1-2 weeks
"Ethomid" HT-15* (fatty acid amide-ethylene oxide condensate)	4 days-1 week
Propylene glycol monostearate (nondispersible)	48-72 hours
"Arlacel" 40** (Sorbitan monostearate)	4-16 hours
Cetyl alcohol	4-16 hours
Diethylene glycol stearate (self-emulsifying)	< 1 minute
"G-1441"** (Polyoxyethylene sorbitol lanolin derivative)	< 1 minute

Emulsifying system (by wt.): 86% propylene glycol, 4% agent, 10% Propellants 12/114 (40/60).

* Armour & Co.

** Atlas Powder Co.

With the exception of cetyl alcohol, none of the agents in Table VI was completely soluble in either the propylene glycol or the fluorinated hydrocarbon propellant. This appears to be necessary in order to obtain the most satisfactory product, both from the standpoint of foam stability and ease of discharge. This suggests that the finely divided solids of the emulsifier are acting as an auxiliary emulsifier and stabilizer. It is well known that finely divided solids may promote emulsification in a number of systems.[7] This may also explain why the self-emulsifying grade of propylene glycol monostearate was considerably more effective than pure propylene glycol monostearate. It is possible that the small quantity of soap present in the self-emulsifying grade dispersed the undissolved propylene glycol monostearate in a somewhat finer form than was obtained with the pure grade.

The formulation with cetyl alcohol as the emulsifying agent appeared to be a "solubilized" system and therefore differs from the other systems. The cetyl alcohol was completely soluble in the propylene glycol-"Freon" propellant mixture, and the formulation appeared to be clear and homogeneous. The system was characterized by an almost liquid discharge which expanded immediately into a foam. This may be related to the absence of dispersed solid emulsifier. In other formulations in which phase separation of the solid emulsifier had occurred, a similar liquid discharge was noted when only the clear portion of the system was discharged. When the solid emulsifier was redispersed throughout the emulsion by shaking, a typical foam discharge was obtained and the resultant foam was more stable than that from the clear portion alone. It is possible that the emulsions with solid emulsifier consist of a "solubilized" system with dispersed solid emulsifier present.

Partial solubility of the agent appears to be only one of the requirements for the most effective emulsifying agent. Many agents, which were only *partially* soluble in the glycol-

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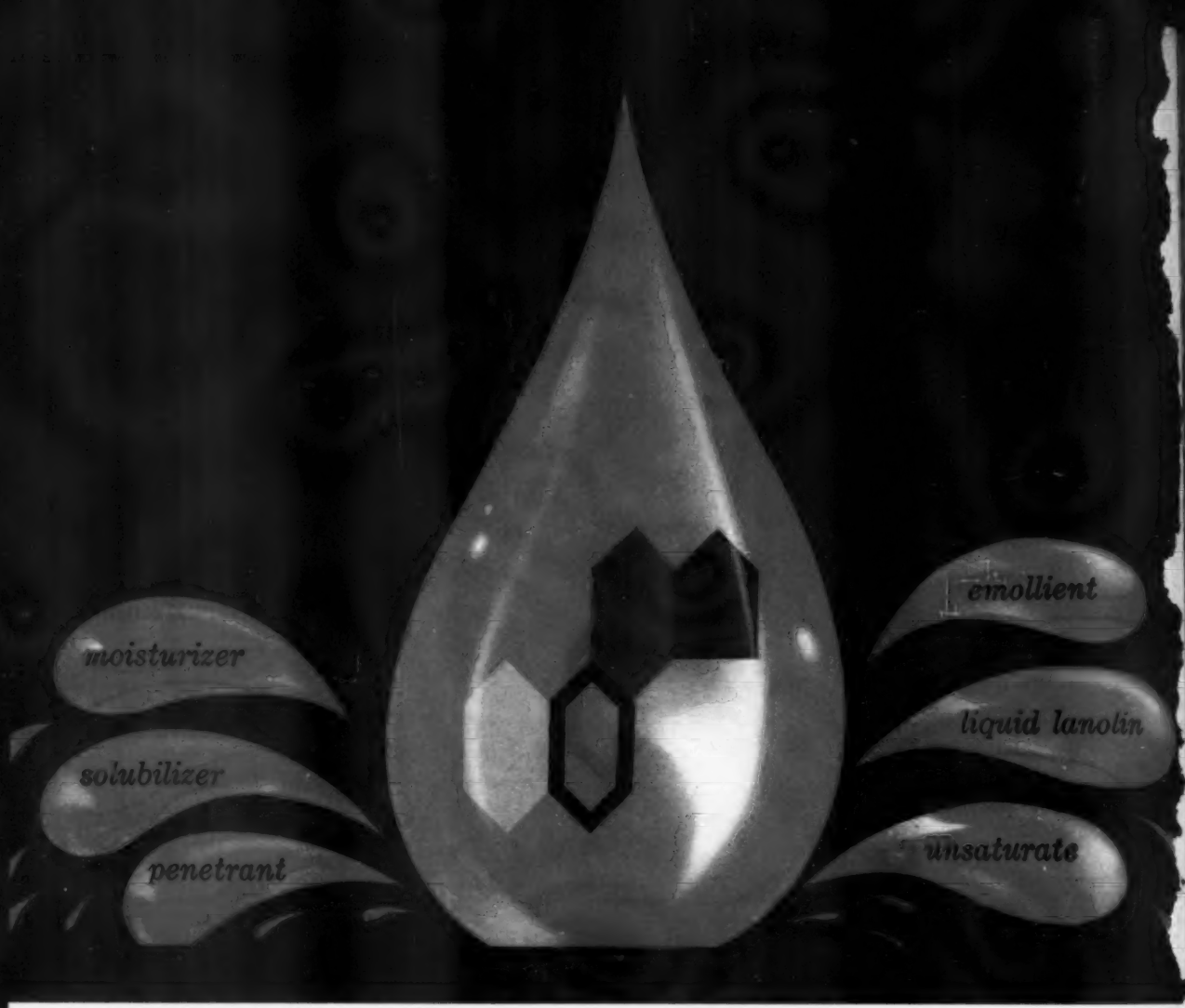

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TABLE VII

EFFECT OF VARIATION IN CONCENTRATION OF SURFACE ACTIVE AGENT UPON FOAM STABILITY

Composition of Emulsion Systems (Wt. %)

Surface Active Agent	*Agent*	*Propylene Glycol*	*Propellants 12/114 (40/60)*	*Foam Stability*
Propylene glycol monostearate (self-emulsifying)	0.5	89.5	10.0	< 1 hour
Propylene glycol monostearate (self-emulsifying)	1.0	89.0	10.0	< 1 hour
Propylene glycol monostearate (self-emulsifying)	2.0	88.0	10.0	> 72 hours
Propylene glycol monostearate (self-emulsifying)	4.0	86.0	10.0	> 72 hours
Propylene glycol monostearate (pure)	0.5	89.5	10.0	< 1 hour
Propylene glycol monostearate (pure)	1.0	89.0	10.0	< 1 hour
Propylene glycol monostearate (pure)	2.0	88.0	10.0	< 1 hour
Propylene glycol monostearate (pure)	4.0	86.0	10.0	48-72 hours

propellant system, did not give stable foams. It is probable that a combination of the proper degree of solubility in both phases, combined with the additional emulsifying activity of the dispersed solids, is necessary for stable foam formation and fine foam discharge.

Foams from samples formulated with "Arlacel" 40, cetyl alcohol or "Ethomid" HT-15 wet paper much more rapidly than those from products with propylene glycol monostearate as the emulsifying agent.

2. *Variation in Concentration of Surface Active Agent*

As with most emulsion systems, there is an optimum concentration of surface active agents where the best results are obtained. The optimum concentration will depend upon the particular agents that are used. If the concentration of the agent is decreased below a given minimum, foam stability is adversely affected. This effect is shown by the data in Table VII, which were obtained by evaluating both self-emulsifying propylene glycol monostearate and pure propylene glycol monostearate at various concentrations in an emulsion system containing propylene glycol and Propellants 12/114 (40/60). Concentrations of surface active agent above 4% give very stable foams, but the use of higher concentrations is questionable, since the possibility of valve clogging is increased considerably.

The wettability of the foams appears to be a function of the stability, as would be expected. Samples formulated with 4.0 parts of either agent did not wet paper towels within one hour after discharge of the foam. Samples containing 2.0 parts or less of agent caused wetting of paper almost immediately.

B. Emulsion Characteristics

The form in which the undissolved surface active agent is present in the emulsion system may influence such properties as foam stability and storage stability. Large masses of undissolved agent ultimately may lead to valve clogging problems or leakage. It is preferable, therefore, that the suspended agent be as finely divided as possible. Factors influencing the dispersion are the type of surface active agent, the concentration of the agent, the type of glycol, and the other solvents that may be present.

1. *Variation in Surface Active Agent*

In systems containing 86% propylene glycol, 4% agent and 10% "Freon-12" / "Freon-114" (40/60), the surface active agent producing the best emulsions with the smallest particles was self-emulsifying propylene glycol monostearate. Pure propylene glycol monostearate gave emulsions with the largest particles, while "Ethomid" HT-15 and "Arlacel" 40 gave emulsions with characteristics in between the other two agents.

2. *Variation in Concentration of Agent*

Emulsions prepared with 4% surface active agent appeared to have a much finer particle size than those with 2% agent. This may be due to the increased viscosity of the emulsions with the higher concentration. As a result, movement and agglomeration of the dispersion may be reduced.

3. *Variation in Glycols*

Emulsion systems prepared with polyethylene glycol 400 appeared to be somewhat smoother than corresponding emulsions prepared with propylene glycol. In these cases, differences between the agents was not as marked as with propylene glycol.

4. *Other Solvents*

The addition of other solvents to the nonaqueous emulsion system may have a considerable effect upon the

(*Continued on Page* 55)

TABLE VIII

EFFECT OF ETHYL ALCOHOL UPON FOAM STABILITY

Composition of Emulsion System (Wt. %)

Propylene Glycol	*Propylene Glycol Monostearate*	*Absolute Ethyl Alcohol*	*Propellants 12/114 (40/60)*	*Foam Stability*
86	4	—	10	48-72 hours
81	4	5	10	48-72 hours
76	4	10	10	24-48 hours
71	4	15	10	1 minute

TABLE IX

EFFECT OF WATER UPON FOAM STABILITY

Composition of Emulsion System (Wt. %)

Propylene Glycol	*Propylene Glycol Monostearate*	*Water*	*Propellants 12/114 (40/60)*	*Foam Stability*
86	4	—	10	48-72 hours
81	4	5	10	24-48 hours
76	4	10	10	4-24 hours
71	4	15	10	4-24 hours
66	4	20	10	4-24 hours

news of pressurized packaging

Stalfort Names Researcher

Herbert C. Cook recently was named pharmaceutical research chemist by the John C. Stalfort & Sons Co., Baltimore, Md., custom filler. He joined the staff of the aerosol laboratory at Stalfort's Presure-Pak division at 2012 Hammonds Ferry Road, Baltimore.

Mr. Cook attended Purdue University, where he graduated with the degree of Bachelor of Science in pharmacy. He saw service with the U.S. Army, doing field laboratory work at the Army Chemical Center at Edgewood Arsenal, Md. Leaving the Army as a first lieutenant he spent several years in an executive capacity with a retail drug chain in Baltimore before going with Stalfort.

•

Williams Consolidates Operations

The J. B. Williams Co., marketer of soaps, aerosol shaving creams and pharmaceuticals, recently closed its 120-year-old Glastonbury (Conn.) plant to consolidate its operations at its Cranford (N. J.) plant. A new company, known as Glastonbury Toiletries, Inc., began operations Oct. 1 in a portion of the Williams plant. The company will manufacture shave preparations, suntan products and other toilet articles on a contract basis for the Williams company.

•

Brown Named to Shulton Post

The appointment of Clyde A. Brown, Jr., as national sales manager of its Toiletries Division has been announced by Shulton, Inc., New York. He will be responsible for all sales to franchised retailers and wholesalers and will make his headquarters at the Shulton offices in Clifton, N. J. The division markets aerosol colognes and shave creams.

Fred Gardner Forms New Aerosol Marketing Firm

FRED GARDNER, former sales manager at Aerosol Techniques, Inc., and Powr-Pak Inc., Bridgeport custom fillers, has founded a new aerosol company to distribute and market pressurized products to the industrial and consumer markets. Called Valhalla Aerosol Products, Inc., it is located at 101 North Lexington Avenue, White Plains, N. Y. The phone number is WHite Plains 8-2038.

Through use of field men, and later perhaps jobbers, the company expects to market its products all over the country—beginning with an emphasis on Eastern markets and then spreading out to other industrial and consumer markets. According to Mr. Gardner, primary activity of the company will be in the industrial field, with most of the currently developed products designed to sell in that area. Industrial products will bear the label "Valhalla," household products "Mt. Pleasant," and insecticides "Nipzit."

Fred Gardner

For the industrial field, major product is a newly formulated mold release spray which Mr. Gardner says displays exceptionally long-lasting high-performance qualities in a variety of industrial applications. Another is a paint remover (for metal or wood) which is simply sprayed on and then may be flushed off with a hose. Among the other industrial products are a more conventional silicon mold release spray, a rust dissolver, a belt dressing, a rust preventive, a tapping oil, and a water repellent.

For the consumer market there will be a complete line of insecticides (flying insect killer, ant-roach spray, moth proofer, and insect repellent), a liquid starch specially scented to appeal to housewives, a car wash, room deodorant, and a liquid detergent.

•

Foster-Forbes Appoints Herst

T. R. Herst has been named aerosol service manager of the Foster-Forbes Glass Co., Marion, Ind., a leading manufacturer of uncoated glass aerosol containers. According to W. S. Coffman, sales manager of the company, "Mr. Herst has been largely responsible for development of the company's uncoated glass aerosol bottle, and in the future will be responsible for all aerosol designs and specifications."

•

Gen. Chem. Names Flanner

The appointment of Lloyd T. Flanner as technical service supervisor of "Genetron" aerosol propellants has been announced by Allied Chemical's General Chemical Division, New York. With the division 12 years, he was associated with its Aerosol Technical Service Laboratory for the past three. Earlier he served as chief chemist of the division's Baton Rouge Works, one of its major "Genetron" producing locations.

Mr. Flanner is an alumnus of Louisiana State University at Baton Rouge with a B.S. degree in chemistry and physics. He resides at 10 Yardley Court, Glen Rock, N. J.

General Chemical's Aerosol Tech-

nical Service Laboratory at Edgewater, N. J., carries out an extensive development program to help provide aerosol fillers and marketers with new and improved "push-button" products. In another facet of its work, the laboratory aids fillers and marketers in their individual product development and testing programs.

•

Mace Appointed by Squibb

E. R. Squibb & Sons, Inc., New York, recently appointed Richard M. Mace to the newly created post of new products manager. He joined the company in 1948 and most recently served as sales manager for Canada.

•

Clayton Corp. Shifts Execs.

Clayton Corp., St. Louis, Mo., major manufacturer of foam-type aerosol valves and overcaps, last month announced the appointment of Earl Graham, former Eastern sales manager, as vice-president of sales. The announcement, made by recently-elected president, Victor Muscat, was the first industry confirmation of Mr. Muscat's new position.

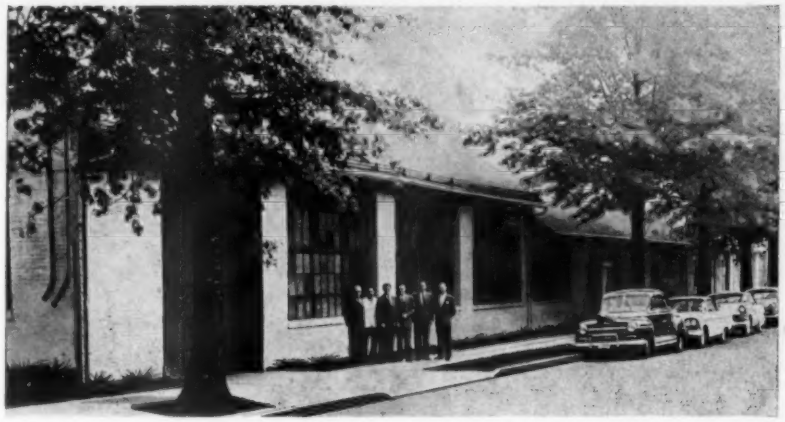
Mr. Graham, is a pioneer in the aerosol industry, having worked on the modification of the drawn beer can for aerosols in 1946 while with Crown Cork & Seal Co. He joined Clayton in Oct. 1957 after having been with Crown for nearly 20 years. Prior to his association with Crown, he was with Francis H. Leggett & Co., Landisville, N. J., food canners and processors. His activities with the CSMA's Aerosol Division have included chairmanship of the Scientific Committee, and vice-chairmanship of the Administrative Committee. He is also active in the Institute of Food Technologists, where he has been instrumental in organizing programs on pressurized food products.

Mr. Muscat is also president of Victor Metal Products Corp., a producer of aluminum aerosol containers, and the Glorion Co., fertilizer producer; but there is no connection between the corporate activties of these companies.

Victor Muscat

W. Earl Graham

Old Empire Expands Installation with Additional Plant



Old Empire Inc., Newark, N. J. custom filler, has just acquired an additional 30,000 square foot building directly adjoining its present buildings. The new building will be used for expanded manufacturing as well as additional warehousing facilities. With the new addition Old Empire now has a total of 140,000 sq. ft.

Shown in front of the company's newly acquired building are, left to right: Hans W. Maucher, Harry Friendenberg, Irving Horowitz, John de Elorza (president), John Horn, and Ellis Reyner.

Hrebenak Joins Strouse, Inc.

Paul Hrebenak has been named marketing representative for Strouse, Inc., Norristown, Pa. aerosol custom filler. He will maintain an Eastern branch office for the company in Hanover, N. J.

During the last five years, Mr. Hrebenak, a graduate of Fairleigh Dickinson University, has been the Eastern representative of Victor Metal Products, handling sales for that company's aerosol cans and tubes. Prior to joining Victor, he was in the New York office of Reynold's Metals.

•

Norda Appoints Amorosi

Leo J. Amorosi has been elected director of the Essential Oils and Aromatic Divisions of the Norda Essential Oils & Chemical Co., New York.

•

Revlon Names Miss Sobol

Revlon, Inc., announced that Miss Frances P. Sobol has joined the company as director of department store relations. She was formerly national director of sales for the Estee Lauder Cosmetic Co., and prior to that was with Maurice Rentner Perfumes.

Two Firms Win Krylon Annual Sales Award

Competition was keen and new sales records were made as sales representatives of Krylon Inc., Norristown, Pa., vied for that company's annual award for outstanding sales achievement. The award, presented at the September Krylon National Sales Meeting in Chicago, produced a tie for top honors, and duplicate awards were presented to Glenn B. White & Associates, Inc., Redwood City and Los Angeles, Calif., and The Newhope Corp., New York City. (Left to right) Richard C. Newbold, Krylon vice-president, sales; Glenn B. White, president, Glenn B. White & Associates, Inc.; James W. Bampton, Krylon president; Lee Rocke, president, The Newhope Corp.; Elmore E. Kayser, Krylon vice-president, advertising & promotion. In addition, each member of the winning organization received handsome gold pen and pencil sets, engraved with his name and "1960 Krylon Sales Leader."

Ritchie Firm Changes Name

Harold F. Ritchie, Inc., Clifton, N. J., manufacturer of cosmetics and pharmaceuticals, last month changed its name to Beecham Products. The move was made to more closely tie in the firm name with that of its parent organization, the Beecham Group, Ltd., of England. The N. J. company is a wholly owned subsidiary of the British company.

This fall Beecham Products will introduce "Maclean's" toothpaste, currently a leading British dentifrice, in the United States.

•

Ferguson Heads NACA

Dr. George R. Ferguson, president of the Geigy Agricultural Chemicals Division of Geigy Chemical Corp., Ardsley, N. Y., was elected president of the National Agricultural Chemicals Association at that group's annual meeting in Coronado, Calif. in late September. He has been a member of the NACA's board of directors since 1958 and last year was the association's vice-president.

•

Croda Ltd. Names Directors

Croda, Ltd., English operating subsidiary of the international lanolin-producing firm, has appointed N. R. Kirkby and H. Taylor as directors. M. Thwaite was named manager of Croda G.m.b.H., Dusseldorf, newly-formed German subsidiary.

•

Velsicol Adds to Midwest Sales

Velsicol Chemical Corp., Chicago, announced the appointments of H. Duane Hosapple and Glenn R. Grosch as sales representatives for its Agricultural Chemicals Division. The new appointments are aimed at extending the company's sales and technical service to additional customers in the Midwest.

Mr. Holsapple is a graduate of the College of Agriculture, Iowa State University, where he received a B.S. degree in agronomy. Mr. Grosch is a graduate of the University of Illinois with a B.S. degree in agriculture. He majored in agronomy.

•

Revlon Adds to Lab. Staff

Revlon, Inc., has announced promotions of six men in its laboratory staff. Revlon's central research laboratory in New York City employs more than 100 graduate chemists and technicians, and Revlon plants at Edison and Passaic, N. J., also employ quality control and product testing staffs.

The following appointments were announced: Samuel Schoenfeld to manager, quality control laboratories at Edison, Passaic and New York; George Pollack to group leader, Passaic quality control laboratory; John Yee to chemist supervising quality control at New York; Bernard Abramson to group leader, pharmaceutical laboratory, New York; Martin Brookins to group leader, hair laboratory, New York, and Terry Gerstein to senior chemist, hair laboratory, New York.

•

Dutch Can Firm Expands

N. V. De Vereenigde Blikfabrieken, Amsterdam manufacturer of tin plate and aluminum cans and closures, will begin production of aerosol containers by the end of 1960. The company's factory at Doesburg will be the site of its aerosol can making facilities, which will consist of an automatic production line for tin plate and black sheet containers. At first, containers of 6 and 12 ounces will be produced, and these will include internally lacquered cans and those completely lithographed.

•

Fritzsche Expands Offices

Fritzsche Brothers, Inc., New York, a leading producer of essential oils and aromatic chemicals, will occupy 10,000 square feet on the seventh floor at 75 Ninth Ave. At present the firm occupies space at 76 Ninth Ave., across the street from its new additional space. The company has been in operation since 1871.

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Cannella Wins CSMA Golf Tournament, DCAT Meet

CONTINENTAL CAN's Len Cannella, the aerosol industry's "winningest" golfer over the past few years, earned two more prizes in September. Twice more in the low 70's, Len walked off with low gross honors at the second annual golf outing of the CSMA at Medinah Country Club, Medinah, Ill., and then repeated the trick in an even bigger field at the annual meeting of the Drug, Chemical and Allied Trades Association at Lake George, N. Y.

The outing of the Chemical Specialties Manufacturers Association, the second this year, drew 115 golfers plus another 35 non-players for the evening dinner. In the earlier outing, held at the Knollwood Country Club in White Plains, N. Y., Mr. Cannella won a special award for second low gross in a tournament won by Eugene McCauliff, president of the Glyco Chemicals Division of Chas. L. Huisking Co. In the annual Aerosol Invitational Golf Tournaments in both 1959 and 1960, Mr. Cannella scored low gross honors.

Runners-up to Mr. Cannella were John Matarese, Leonard Drell (Aeropak, Inc.), Mr. McCauliff and John Hulten (Union Carbide), in that order. First through tenth low net honors were won by Herbert Pass (Sherwin-Williams Co. of Canada), Bob Peterson (Peterson Filling), Earl Christiansen, Bill Ackley (International Flavors & Fragrances), Jules Heckler, Brooks Ricca (Pennsalt Chemicals), Jack Schenberg (B. T. Babbitt), A. Kulick, Ed Seymour (Seymour of Sycamore) and Clarence Carter (Continental Filling).

B. Couch had the longest drive, Fred Lodes (Lodes Aerosol Consultants) was second, and Gene Rose (Gene Rose Co.) was third. Nearest to the pin honors on a specially selected hole were Bob Hyndman, J. W. Marcus and H. Wolf.

•

TGA Changes FT Stand

The board of directors of The Toilet Goods Association at its regular meeting held Sept. 29, went on record as favoring the principles of price maintenance. This is a reversal of the original position of the association which previously took no position relative to "Fair Trade." A special committee on Fair Trade has been appointed under the chairmanship of Oscar Kolin, vice-president of Helena Rubinstein, Inc.

•

Pressure Pak Names Agent

Pressure Pak, Inc., West Palm Beach, Fla., aerosol equipment manufacturer, last month announced that the Hoshall Company of Atlanta, Ga., manufacturer's agent in the Gate City for 20 years, will represent Pressure Pak in the southeastern United States. Pressure Pak recently placed on the market a low run or laboratory aerosol filling unit priced at $400, in addition to their production model line.

•

Aerocide Dispensers Expands Lab

Aerocide Dispensers Ltd., Toronto, major Canadian custom filler, is currently adding 7,000 square feet to its Plant No. 1 in an expansion to cost $125,000. Most of the new space will be devoted to a new, larger air-conditioned laboratory, with the remainder to go toward increased blending capacity for the company's aerosol filling lines. When the project is completed, about Dec. 15, Aerocide Dispensers will have a total capacity of 50,000 square feet.

•

GAF Appoints Schulze

Dr. C. C. Schulze has been appointed general manager of the Antara Chemicals Division of General Aniline & Film Corp., New York. The division is the primary producer of PVP and PVP co-polymers.

DuPont "Freon" Div. Names 3

James Gay Gordon, III, has been appointed to the newly created post of supervisor of aerosol programs in

J. G. Gordon

F. E. Cooper

DuPont's "Freon" Products Division, Wilmington, Del. In his new assignment, he will be responsible for developing special programs to provide technical and other assistance to commercial users of "Freon" aerosol propellants.

Simultaneously with Mr. Gordon's appointment, DuPont announces that Francis E. Cooper, "Freon" salesman, has been named to succeed Mr. Gordon as sales supervisor in the Eastern district office in New York City and Alfred P. Dougherty, Jr., has been named salesman in the New York territory replacing Mr. Cooper.

A native of Philadelphia, Mr. Gordon was graduated from Princeton University with a Bachelor of Arts degree in 1948, after having served as a naval gunnery officer in the Pacific theatre from 1944 to 1946. Following several years' sales experience in the chemical and food industries, he joined the DuPont "Freon" Products Division in mid-1954 as a sales representative, and in 1958 was made sales supervisor of the Eastern district.

Mr. Cooper started with DuPont in 1939 as a project expediter in the Engineering Department. He served as a naval flight school instructor during the war. After rejoining DuPont he became a salesman in the "Freon" Products Division in 1951.

A. P. Dougherty

Mr. Dougherty, also a Wilmingtonian, was graduated from the University of Delaware in 1956 with a Bachelor of Arts degree. He has been a sales correspondent and sales assistant in the Eastern district office since joining the Division in 1956.

J. B. Williams Names Abrams

George Abrams, former president of the Hudnut-DuBarry Division of Warner-Lambert Pharmaceutical Co., has been named vice president of corporate development of the J. B. Williams Co., Glastonbury, Conn., marketer of shave preparations and pharmaceuticals. According to Williams president Matthew B. Rosenhaus, Mr. Abrams's chief activity will be a "concentration on acquisitions and product development."

Mr. Abrams was vice president of Revlon, Inc., during that company's period of major growth. His departure from Warner-Lambert in August was attributed by *The New York Times* to a controversy over his belief that new cosmetic products should be introduced in spectacular, costly campaigns, as against the company policy that they should be introduced quietly in test markets.

•

Florida Passes Registration Law

A Food, Drug, and Cosmetic Registration Act has been passed by the State of Florida which would require the formal registration of these products beginning January 15, 1961. The bill was passed by the Florida State Assembly with only one negative vote and passed unanimously in the state Senate.

It calls for a registration fee of $2.50 per individual product, with each different shade or odor of a product to be judged a separate product. An over-all total of $25 is allowed for more than ten products.

This law, termed a piece of "nuisance legislation" by a number of cosmetic marketers, is similar to a law currently in force in Louisiana.

•

Calif. Spray in Merger

California Spray Chemical Co., San Francisco, major marketer of aerosol insecticides under the "Ortho" brand, last month was merged with another operating subsidiary of Standard Oil of California, Oronite Chemical, to form California Chemical Co. Calspray has become the Ortho Division of California Chemical and will be headed by H. J. Grady, president, with M. E. Wierenga as marketing vice president, L. R. Gardner as vice president for research and development, and F. J. Juchter as vice president for manufacturing.

•

New Filler Offers Services

Mist Products, Inc., Box 1756, Grand Central Station, New York 17, last month announced that it is offering its services for aerosol packaging of small quantities of new or experimental formulations, with no minimum quantity requirements. The company is equipped to fill pressurized containers of chemical reagents used in chromatographic and other specialized analytical, clinical, and testing procedures.

Names Pilsbury to New Post

Richard C. Pilsbury, manager of drug and chemical sales in the New York branch of Owens-Illinois Glass Co., has been promoted to Western Regional Sales Manager with headquarters in Chicago. A native of Alton, Ill., he was educated at Principia College and the Harvard School of Business.

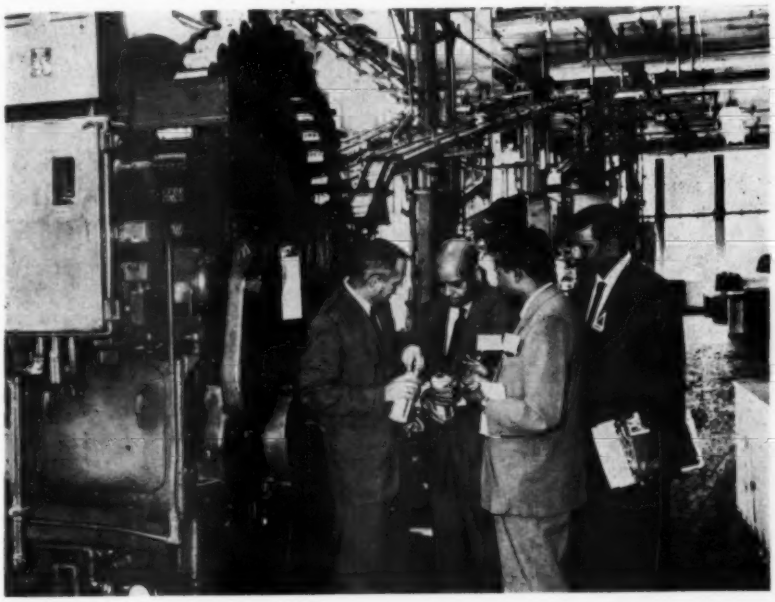
He joined Owens-Illinois in 1947. He will be in charge of O-I's glass container sales branches in Chicago, Elkhart, Kansas City, Milwaukee, Omaha, Peoria, St. Louis, and St. Paul.

•

Helene Curtis Names Lipsey

Richard A. Lipsey has been named assistant to the director of market research and planning at Helene Curtis Industries, Inc., Chicago, marketer of hair sprays and other products.

Indian Packaging Executives See Aerosol Cans Made



Packaging executives from India recently toured the Hudson plant of American Can Company's Canco Division in Jersey City, N. J., and saw aerosol cans being made on a high-speed automatic production line. Visiting the U. S. under the auspices of the Department of State's International Cooperation Administration, the nine-member team spent a month in the U. S. studying American packaging industries.

In the photograph above are Ward Johnson, supervisor of quality control for the Canco plant; Bhikaji B. Sardeshpande, team leader and a managing director of Corn Products Co. (India), Ltd., Salem; Sangameswara Sathyanarayanan, managing director, South India Glass and Enamel Works, Ltd., Bombay, and Dhirajlal M. Javeri, a partner of Ryland Paper Box Co., Ltd., Bombay.

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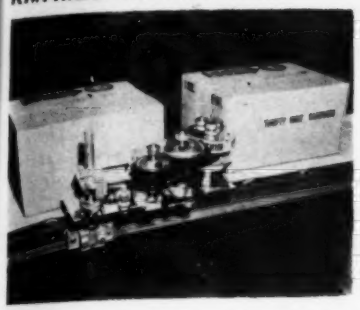
equipment processes bulletins

Kiwi Introduces New Coder



A new code dater, using an ink reservoir system, has been introduced by Kiwi Coders Corp., 4027 North Kedzie Ave., Chicago 18, Ill. The company reports that one internal inking lasts from two to four weeks or 25,000 to 150,000 impressions, depending upon the size of the type and the number of characters. A polyethylene squeeze bottle is used to refill the reservoir. Average cost of ink for one code dater per year is said to be about $3.

•

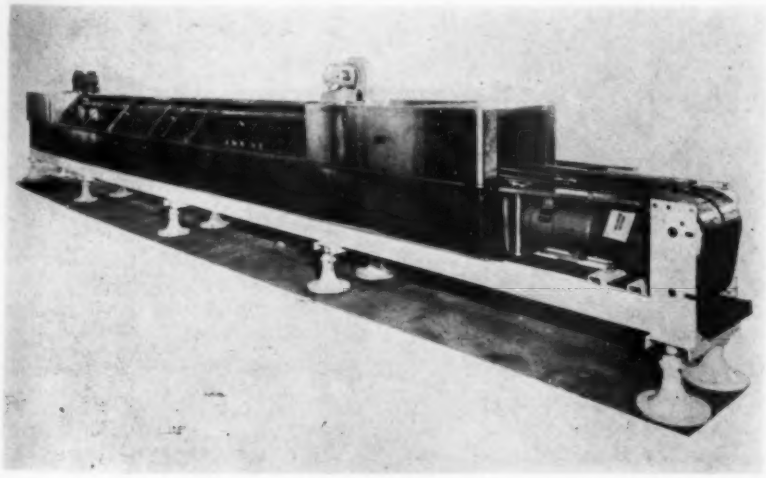
Beckman Introduces Pycnometer

The Scientific and Process Instruments Division of Beckman Instruments, Inc., Fullerton, Calif., has just introduced a new air comparison pycnometer. Designed for rapid measurement of volume, density, and porosity of irregular, powdered, or porous solids, it requires no liquids, gas pressure determination, or temperature control. It provides true volume measurement for specific gravity and density in such applications as chemical mixture determinations. The measurement is nondestructive and can be completed in less than one minute.

Island Equipment Offers New Test Tank

Island Equipment Corp., P.O. Box 38-276, Miami 38, Fla., has installed a new safety feature on its aerosol heat and leak test tank as optional equipment. The feature is a stainless steel inspection hood with shatterproof safety glass sliding doors on one side and solid or expanded metal sheet on the reverse side.

The hood is 12 feet long with three four-foot panels. At each end is a three-foot-long stainless steel hood. Blowers can be mounted on each hood with a perforated pipe running under the inspection hood to defog the glass doors and add to visibility. An additional optional feature is double half-oval stainless steel guard rails on the outside edges of the chain.



Nalbach Unveils Crimper

A new aerosol crimper for laboratory or slow speed production has been developed by John R. Nalbach Engineering Co., 6139 Ogden Ave., Chicago 50, Ill. Measuring 18¼ high, the unit has stainless steel crimping collets and mandril and is adjustable to provide depth of crimp desired. The container is automatically centered by adjusted container stops.

•

Dale Offers New Type Can

A one-piece aluminum aerosol can featuring a neck rolled outward (instead of inward) has been developed by John Dale, Ltd., Brunswick Park Road, London N. 11, England, a leading British container manufacturer. The new design, the company says, is aimed at solving the problem of how to lacquer the inside of the formed container in a way which would insure 100% coverage of the inside of the curled neck of the container. The new neck is also expected to facilitate decoration problems,

particularly anodization, which were complicated by the presence of chemical deposits on the inside of the curl.

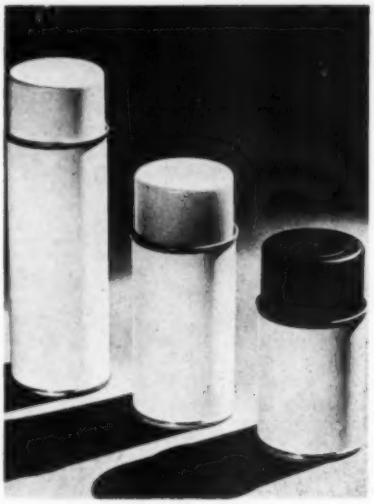
•

Frank Unveils New Cap

Designed to accommodate the highest aerosol push valves, a new overcap has been introduced by the Walter Frank Organization, packaging engineers and designers of Hillside, Ill. The new proprietary cap, designated the "No. 710," is designed to fit the body diameter of three-piece aerosol cans and add elegance. For greater strength, the cap is equipped with a full internal ring which fits over the top of the mounting cup.

Made in high impact polystyrene, the rigidity and strength of the new overcap make it ideally suited for fast, automatic capping. The cap is quantity-stocked in black and white and is also available in a wide variety of colors.

The new cap was designed to meet the growing popularity of higher and better designed aerosol actuator



valves. Further information may be obtained from the company at 4100 Warren Ave., Hillside, Ill.

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Fritzsche Offers Catalog

Fritzsche Brothers, Inc., New York, has issued a new 12-page price list and catalog listing its aromatic chemicals, floral absolutes, essential oils, fixatives, and flavors.

New Vanderbilt Tech. Bulletin

A new technical bulletin giving cosmetic and pharmaceutical formulas for use with "Veegum" and "Vancide" has been issued by R. T. Vanderbilt Co., 230 Park Ave., New York 17. "Veegum" is an emulsion stabilizer and suspending agent and "Vancide" is a bactericide.

Typical of the formulations suggested is this one for an aerosol sun tan lotion:

	% by wt.
(A)	
VEEGUM	1.5
Water	88.0
Propylene glycol	3.0
(B)	
Diglycol stearate S	3.0
Silicone, Dow 555[1]	1.0
Cetyl alcohol	0.5
Acetulan[2]	2.0
Giv-Tan F Sunscreen[3]	1.0
Preservative	q.s.

Procedure:

I Add the VEEGUM to the water slowly, agitating continually until smooth. Add the propylene glycol and heat to 75-80°C.

II Heat B to 70-75°C.

III Add A to B, mix until cool.

[1] *Dow Corning Corp.*
[2] *American Cholesterol Products*
[3] *Sindar Corp.*

This emulsion is non-tacky and spreads easily when dispensed as an aerosol foam.

Aerosol Packaging Producedure:

Above concentrate:	100 grams
Propellant 12/114 40/60 ratio:	12 grams

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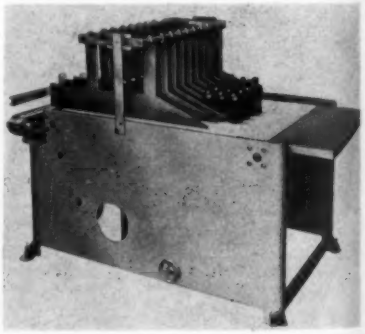
MRM Offers Container Feeder



An automatic feeder capable of handling all shapes and sizes of glass, plastic, and metal containers at speeds up to 250 per minute, has been developed by MRM Co., 191 Berry Street, Brooklyn, N. Y. The machine automatically carries and places uncartoned containers on the conveyor at the start of a packaging line. With a variable speed motor control and variable travel control,

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- **Inker never dries out**
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Also . . .
case printers for consecutive numbering or printing information on cases

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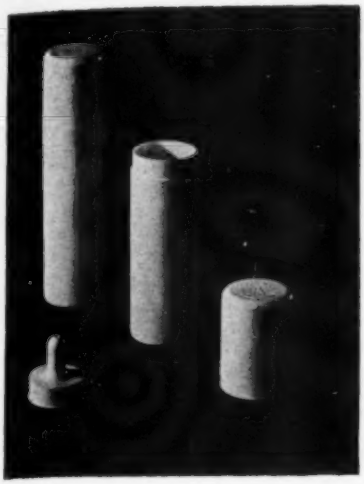
it is said to permit a single operator to perform duties frequently handled by two or three workers.

•

Plasti-Coated Container



Development and manufacture of a new plastic container for a topical foam aerosol recently introduced by Schering Corp. is said to permit lower packaging cost. Developed by Emson Research, Inc., Bridgeport, Conn., and made of sturdy, lightweight Super Dylan plastic, the new package holds a 12 cc. glass bottle which contains a special formulation. Topped by an Emson metered valve, the container dispenses a measured amount of foam aerosol.

Custom made for use with Emson valves, the new plastic container is said to have a wide range of aerosol application. Simple in construction, it consists of an outer container for a glass or metal bottle, an overcap and an actuator—all made of sturdy plastic. The outer container may be made in a variety of colors, can be embossed or decorated, and affords maximum safety, particularly for glass inner containers. Additional information may be obtained from Emson Research, Inc., 118 Burr Court, Bridgeport, Conn.

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Popper Issues New Catalog

Popper & Sons, Inc., 300 Park Avenue, New York 10, last month issued a new catalog covering its expanded line of volumetric type filling machines. Called "Catalog 860F", it consists of 12 pages of photographs, descriptions, and technical data of a full range of machines, with particular emphasis on table models. Most of the units are used in pharmaceutical, cosmetic, and food plants.

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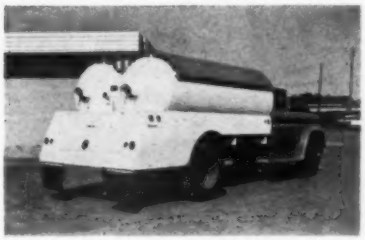
New Propellant Tank Truck

Master Tank & Welding, Co., Dallas, has developed this twin-barrel delivery truck with a special sun shield for hot weather sun reflection. The truck has a 2000-gallon capacity and is mounted on a Chevrolet 7500 chassis. Sun shield is made of corrugated heavy-duty aluminum with a ripple finish.



Givaudan Synthesizes Sandalwood

Givaudan-Delawanna, Inc., New York, in what it termed a "major breakthrough in the field of perfume chemistry", last month announced development of a single aromatic chemical with all the desirable characteristics of natural sandalwood oil. To be marketed under the tradename "Sandela GD", this new polycyclic alcohol is now available in commerical quantities at a cost presently one-third that of sandalwood oil.

It has been evaluated in aerosols, cosmetic preparations, and soaps, and according to the company, has been found to have properties which permit the development of notes heretofore attainable only with natural sandalwood oil. It is reported to be clearly soluble in two volumes of 80% alcohol and miscible in 95% alcohol, but insoluble in glycerine and water. Evaluation of solubility, stability in various aerosol propel-

lants, corrosion and clogging tendencies, odor change, etc., in the company's aerosol laboratories are reported to have indicated that the material would "present no difficulties" in aerosol formulations.

"Sandela GD2" can be used in perfume formulations exactly as is the natural oil, Givaudan points out.

In the area of residual properties is claimed to be even superior in many characteristics to natural sandalwood.

Samples and more detailed information are available from Givaudan Delawanna, Inc., at 321 West 44th Street, New York 36, N. Y.

Retailer Education a Prime Need, Fragrance Group Told

FRAGRANCE products are only as good as the girls behind the counter, Dorothy Hinshaw of Carson Pirie Scott & Co. told a luncheon of the Fragrance Foundation at New York's Hotel Pierre on Sept. 28. One of a panel of five, Mrs. Hinshaw acknowledged that aerosols have become increasingly important in the fragrance retailing field, and suggested that in this area retailer education could be especially significant.

"The fragrance industry still has a large untapped market," Mrs. Hinshaw declared, pointing out that teenagers, non-users, and those who use fragrance sparingly all could be converted to large volume markets. Fragrance demonstrators, she contended, should be looked on as the best jobs in retail department stores, yet "little has been done to find, train and enthuse them." The personal touch in selling, she emphasized, is missing.

Mrs. Hinshaw said that fragrances should not be sold seasonally, nor should their quality be jeopardized through poor presentation or improper price promotion. The latter she defined as one "too long on the counter," so that its novelty value is lost. Spraying perfume to attract customers, through aerosols and similar devices, is an excellent way to recruit new purchasers, she suggested, especially if the effort is tied in some way to the store's advertising.

Mrs. Louise Soresi of B. Altman & Co. reported that customers are becoming more oriented toward colognes and toilet waters, possibly because of the impact of aerosols. She agreed with Mrs. Hinshaw about price promotions, pointing out that half-price sales encourage stocking up rather than return sales.

Sales clerks, she suggested, should demonstrate real knowledge of the product, together with a good bit of enthusiasm. Eye appeal for the package is essential, and this, coupled with product quality and salesgirl enthusiasm, will ensure good sales.

Dennis James, radio and television personality, suggested that the vast male market has been virtually untapped by the fragrance marketer. He ventured the opinion that the "he-man aroma" approach to selling is a wrong one, since men do not want to feel like "sissies" when they use the fragrance.

Familiarity is essential in feminine purchases of fragrance products, Judy McGuire, 1960 Ivy League Queen and Vassar College sophomore, said. Miss McGuire urged that, since not many college girls buy perfume themselves anyway (but rely on relatives to give them gifts), fragrance marketers would do well to send samples to college girls to establish a product image for future purchases.

Final speaker on the program was Maggi McNellis, another radio and television personality, who quoted the opinions of a number of celebrities on the importance of fragrance.

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Pero Joins Plastics Firm

Aldo S. Pero, former vice president of Fluid Chemical Co., Newark, N. J., custom filler, has joined the Garmold Division of Container Corp. of America, Totowa, N. J., as director of sales for its expanded activities in injection and compression molding of closures and other packaging components. Prior to his association with Fluid, he was general manager of the Precision Extruders Division of the Foster Grant Co.

SCC Lists Program for Annual Meeting

THE ANNUAL meeting, reception and dinner dance of the Society of Cosmetic Chemists will be held at the Hotel Biltmore in New York on Tuesday, November 29. E. Allen Newcomb, program chairman, has announced the following speakers for the meeting:

MORNING SESSION 9:00 a.m.–12:30 p.m.

1. *Cosmetic Advertising Under the Federal Trade Commission Act*
   Charles A. Sweeny
   Bureau of Investigation, Office of the Chief
   Project Attorney
   Federal Trade Commission
   Washington, D. C.
2. *Some Toxicologic and Clinical Studies with Dihydroxyacetone*
   Leon Goldman, M.D.
   College of Medicine
   University of Cincinnati
3. *Systemic Effects of Topically Applied Cosmetics*
   Frederick Reiss, M.D.
   Post Graduate Medical School
   New York University
4. *The Current Status of Acne Management*
   John Strauss, M.D.
   School of Medicine
   Boston University

The afternoon session will consist of a symposium on the subject of new manufacturing techniques, with special emphasis on the transition from laboratory scale to plant batch production. The symposium will include a discussion of sonic emulsification by Drs. Donald M. Skanen and Harold M. Beal, College of Pharmacy, University of Connecticut, and six papers on emulsions, liquid-solid and solid-solid mixing by John F. Fischer of Paterson Kelley Co.

Panel to Highlight CSMA Meeting Program

SPEECHES and a panel discussion of significant interest to aerosol industry management will be the feature of the Aerosol Division's program at the 47th annual meeting of the Chemical Specialties Manufacturers Association, Hollywood Beach, Fla., in December.

The Division's session on Wed., Dec. 7, will be highlighted by three talks on fundamental business management topics. Elliott Averett, vice-president of the Bank of New York, will talk on "Financing Growth Industries." James Sheridan, vice-president and treasurer, Allied Chemical Corp., will speak on "Credit Fundamentals: Dynamic or Static." John A. Willis, assistant secretary and assistant treasurer, Union Carbide Corp., will discuss "Guideposts for Evaluating Profit Performance."

The second portion of the program will be a panel discussion devoted to "Quality Control in the Filler's Plant." Experts on the panel will review current techniques and developments in this phase of production, with George Barr, president of G. Barr & Co. (chairman-elect of the Aerosol Division), as moderator. Panel speakers will include:

Valves — Norbert Brusky, aerosol product quality control supervisor, S. C. Johnson & Son, Inc.

Containers — Russell P. McGhie, supervisor of package construction, Toilet-Articles Division of Colgate-Palmolive Co.

Propellant and Propellant Systems—Donald Dean, manager of control and analytical laboratory, Shulton, Inc.

Concentrate and Concentrate Systems—S. J. Campbell, vice-president, Continental Filling Corp.

Production Line Filling and Weighing Station—S. J. Campbell.

Water Bath Spray Checking Systems—S. J. Campbell.

Laboratory Quality Control Procedures—D. H. Terry, director of research, Boyle-Midway Division of American Home Products Corp.

Special Quality Controls for Pharmaceuticals—John C. Armstrong, Armstrong Laboratories, Inc.

Special Quality Controls for Foods—Clarence Clapp, vice-president, Western Filling Corp.

What Quality Control Procedures a Marketer Expects of His Filler—Dr. T. Harrison, new products manager, Lehn & Fink Products Corp.

Application of Statistical Quality Control to Aerosol Filling—E. K. Kitow, G. Barr & Co.

Following the panel discussion there will be a question-and-answer period using written questions submitted from the floor or in advance of the meeting. Industry members who have questions on quality control are invited to direct them to J. J. Tomlinson, chairman of Program Committee, CSMA Aerosol Division, 50 East 41st Street, New York 17.

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A Correction

The September "Aerosols in Review" column did a slight injustice to an excellent article on fluorocarbon propellants in the July 18 issue of *Chemical and Engineering News*. The "Review" column reported *C & E News* as saying that shave creams do not use fluorocarbons. Actually, the magazine correctly stated that shave creams "favor other propellants such as propane." Since there *is* a growing tendency to substitute liquefied petroleum propellants for the fluorocarbons, the *C & E News* statement is the correct one.—THE EDITOR.

Chicago SCC to Hear Chemist

Fred Klepetar, senior research chemist of the Dutch Brand Division of Johns-Manville Corp., will be the featured speaker on Tuesday, Nov. 15, at a meeting of the Chicago Chapter of the Society of Cosmetic Chemists. He will speak on "Professional Problems of the American Chemist."

•

Carbide Offices Move

The New York headquarters of the Union Carbide Chemicals Co. Division of Union Carbide Corp., makers of "Ucon" propellants, have been moved from 42nd Street to 270 Park Avenue, New York 17. Telephone number is LL 1-2345.

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SCC Holds Annual Seminar, Rheology Is a Key Subject

TWO hundred cosmetic chemists from all sections of the United States, as well as foreign representatives from Canada, Mexico, and England, attended the seventh annual seminar of the Society of Cosmetic Chemists on Sept. 15 and 16 at Chicago's Drake Hotel. The seminar, conducted by Warren B. Dennis as Chairman, consisted of three sections on the subjects of "Enzymes of the Skin", "Hair Coloring", and "Analysis of Cosmetic Mixtures."

Prior to the technical part of the program, Maison deNavarre, president of the International Federation of Societies of Cosmetic Chemists, reviewed the group's activities and announced that it now consists of affiliated groups from the U. S., England, France, Germany, Switzerland, Belgium, Denmark, Spain, Italy, and Japan. Dr. R. M. Marriott, incoming president of the IFSCC, journeyed from England to attend the seminar, and also presented a technical paper.

Dr. Marriott, director of research at County Laboratories, Ltd., spoke on "Rheological Measurements in the Cosmetic Industry", and declared: "The appearance of the product, and, of course, its odor are really *superficial* characterizations of the more fundamental physical structure; and these attributes demand the use of rheological assessment.

'Whilst in many instances," he continued, "the raw materials used in compounding the product may have to be examined insofar as rheological features can be fairly accurately described and can give a measure of quality; nevertheless, these properties may often be confusing in a composition containing many ingredients, each of which may have an effect on one or more of the other substances."

He advised that the tests employed should be rapid ones which give a reasonable degree of accuracy and a high degree of reproducibility. He suggested that in the future a more precise and specific form of measurement will be desired so that one can "formulate an equation or series of equations which when fed into a calculating machine would result in a precise and satisfactory formula."

Speaking on "The Skin as a Sensory Organ", Dr. R. K. Winkelmann of the Mayo Foundation said that contrary to general belief, in neurodermatitis or chronic itchy skin there are less nerve fibers rather than more. He explained that the increased itchiness occurs as a result of breaking up of the ordinary pattern of sensations under chemical changes associated with inflammation.

Robert J. Manning of Beckman Instruments, Inc., explained some of the recent advances in instrumental techniques of analysis, and devoted particular attention to the joint use of gas chromatography and absorption spectroscopy in the analysis of complex mixtures.

Arriving at Chicago (from left): H. J. Amsterdam, president; Dr. Sophie L. Plechner, president-elect; Dr. R. H. Marriott; and Walter Wynne.

CSMA Lists Judges for Aerosol Contest

THE largest number of entries ever submitted for the annual Aerosol Package Awards Contest, conducted by the Aerosol Division of the Chemical Specialties Manufacturers Association have been received for this year's competition. According to J. J. Tomlinson, Package Awards Committee Chairman, more than 225 entries had been received by the Oct. 15 closing date, and "a flood of last-minute contest entry blanks indicated that many more packages are still in the mails."

The packages will be judged Nov. 2 by a panel of seven specialists from the fields of package design, merchandising, and advertising. Announcement of winners and presentation of awards will be made at the CSMA's 47th annual meeting in Hollywood, Fla., on Dec. 5.

Judges for the contest are:

Miss Carol Adams, National Family Opinion, Inc., consumer research organization.

Miss Dorothy Diamond, editor of the "Woman's Viewpoint" column of *Printers Ink* magazine.

Frank Gianninoto, package designer, Frank Gianninoto Associates.

Peter Hilton, president, Kastor, Hilton, Chesley, Clifford & Atherton, Inc., advertising agency.

Kenneth L. Hirst, head buyer of cosmetics and toiletries, W. T. Grant Co.

Mr. James Moyer, head buyer of cosmetics, Lord & Taylor Company.

Cecile Hayward, home furnishings coordinator, *Living For Young Homemakers.*

In this year's contest there are 15 product classifications, including three new ones covering types of aerosols which have become major sales categories in recent years. These are automotive, veterinary and pet products, and horticultural products. In addition, a special category of foreign entries has been established in which an award will be given to the best foreign entry among all the foreign packages competing in the various product categories.

Di Cuollo to Colgate Post

The appointment of Dr. C. John Di Cuollo to the Research and Development Department of its Toilet Articles Division has been announced by Colgate-Palmolive Co., New York.

Dr. Di Cuollo, whose primary field of interest is bio-chemistry, joined the Skin Products Section at the Colgate- Palmolive Laboratories in Jersey City. He received his B.S. degree from Virginia Polytechnic Institute in 1956 and recently was awarded his doctoral degree in biochemistry by Rutgers University.

Glidden Enters Mexico Market

Glidden International C.A., overseas subsidiary of the Cleveland paint company, has entered the Mexican paint market with acquisition of General Paint Co. de Mexico.

Plasti-Kote Reveals Plans for Three New Plants

IMMEDIATE construction plans for a new million dollar, 100,000 square foot aerosol paint plant have been announced by Plasti-Kote, Inc., Cleveland aerosol paint manufacturer. The announcement said that the new plant will have a 20-million can production capacity per year. To be located in the Cleveland area, it will be built on a ten-acre tract and will be designed for expansion of an additional 100,000 square feet in the future. Elias Shapiro, executive vice president, reported the new plant will be the largest and most modern ever built in the aerosol paint industry. Features of the plant will include the latest aerosol paint production lines, extensive warehouse and dock areas, and the most modern in fireproofing, lighting and safety equipment.

Mr. Shapiro said Plasti-Kote expansion plans also call for construction early in 1961 of two other new 25,000 square foot plants in Los Angeles and Toronto, Canada. He said each plant will cost approximately a quarter of a million dollars and will have an annual production capacity of 3 million cans.

Completion of all the new plants is expected by mid-1961.

Mr. Shapiro said a training program for supervisory personnel will be immediately inaugurated at the Cleveland plant to train personnel to go into the Los Angeles and Toronto plants next year.

At the same time he announced that Plasti-Kote sales for 1960 are up 40%. He estimates 1960 sales at nearly $5 million. Mr. Shapiro predicted a 50% increase in sales for 1961, or a goal of $7½ million. He predicted sales of $20 million within the next few years. He revealed that in order to attain the company's sales goal for 1961, Plasti-Kote will introduce a completely new aerosol spray paint package in 1961. The package will feature a new formulation discovery and an entirely new and exclusive spray head. He said the entire program will be backed by the largest advertising, promotion and public relations campaign in the history of the aerosol paint industry. Alan M. Shapiro Advertising of Philadelphia will handle national advertising, and Monroe B. Scharff and Co. of New York will handle the public relations and publicity program. Plasti-Kote became a subsidiary of New England Industries this year.

LEGAL NOTICE

Statement of ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233).

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1. That the names and addresses of publisher, editor, managing editor and business managers are: Publisher, Wayne E. Dorland, P.O. Box 31, Caldwell, N. J.; Editor, Donald A. Davis, P.O. Box 31, Caldwell, N. J.; Technical Editor, Eleanore Kanar, P.O. Box 31, Caldwell, N. J.; Business Manager, Ralph E. Dorland, P.O. Box 31, Caldwell, N. J.

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required by the act of June 11, 1960 to be included in all statements regardless of frequency of issue.) . . . 2853

Signed—Wayne E. Dorland, Publisher

Sworn to and subscribed before me this 1st day of October, 1960.

(Seal) David R. Tryon

(My commission expires May 11, 1964)

Craig Moved to West Coast

Frank Craig, West Coast representative for the Kartridg Pak Co., Mt. Prospect, Ill., has moved to 19111 E. Swanee Lane, Covina, Calif. (telephone EDgewood 1-1191). He had previously been located in the San Francisco area.

The Kartridg Pak Co. makes complete aerosol filling lines for both small and large volume users, as well as machinery for packaging meat, sausage, certain foods and other semi-viscous products. The Kartridg Pak Co. is a wholly owned subsidiary of Oscar Mayer & Co., Madison, Wis.

Hardware Show

(*From Page* 29)

9. *Illinois Bronze Powder Co.*—The new "Spray-O-Namel" plater's finish metallic products, plus the company's usual line of aerosol paint sprays.

10. *Camp Chemical Co.*—its line of four aerosols, a house and garden insect killer, garbage can deodorant, roach and ant spray, and room deodorant.

11. *Boyer Chemical Co.*—spray lubricant, moth proofer, all-purpose insecticide, and pine room deodorant.

12. *Desmond Bros.*—"Deft", a wood finish that is supposed to provide raw wood within "bar-top finish" with no primer.

13. *Nip-Co. Manufacturing*—"Rust Nip", a low-priced rust solvent, and "Garbo" a non-toxic garbage can deodorant and fly repellent.

14. *W. J. Ruscoe Co.*—"Dependable" a penetrating oil containing molybdenum disulfide.

15. *Upson Chemical Corp.*—"Tile Smile", a wall tile cleaner for polishing all kinds of tiles.

16. *The Renard Co.*—"Artificial Flower and Foliage Spray", a special formulation for use on polyethylene flowers and foliage, which is supposed to repel airborne dust. Also "Mist-O-Cide" bird spray, pet spray, pet deodorant, and pet repellent.

17. *Aceline Products Corp.*—"Pet Ease", a tick spray, "Pet Groom", a dry bath, and "ADR Dog and Cat Repellent".

18. *Thermwell Products Co.*—"Frost King", a spray wax, with silicones", for preserving metal surfaces and preventing squeaking; and "Flower King" a leaf shine with PVP.

19. *Speco, Inc.* (Cleveland)—"Ice Rem" a snow and ice melting spray for cars and steps.

20. *DeMert & Dougherty, Inc.*—(Chicago) "Rainz", a new "rose spray", and the "Spray-Bush Sprayer", a propellant cartridge spray gun device retailing at $2.49.

21. *Union Carbide Consumer Products Co.* (New York)—"Eveready" insecticides, plus the new "Prestone Aerosol De-Icer" and a new car spray to restore new car odor to older cars.

22. *Stim-U-Plant Laboratories, Inc.* (Columbus, 9).—leaf polish, flower garden and rose spray, and African violet spray.

23. *Miller Chemical & Fertilizer Corp.* (Baltimore)—four insecticide aerosols, including its "Kwik Tox" insect spray, fly and mosquito spray, and roach and ant spray.

25. *Amchem Products Inc.* (Ambler, Pa.)—poison ivy killer and gibberellic acid spray for speeded-up plant growth.

26. *Boyle-Midway Division of American Home Products Corp.* (New York)—"Antrol" rose spray, tree wound dressing, leaf shine, and African violet spray; and "Ridz" indoor and outdoor dog repellent.

27. *B. G. Pratt Co.* (Paterson, N. J.)—"Pratt's" rose and floral bomb and "D-X" aero-spray, a non-poisonous insecticide.

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28. *Knapp-Monarch Co.* (St. Louis)—"Magic Mist" and "Kwik Mist" insecticides and room deodorants.

29. *Kerr Chemcials, Inc.* (Des Plaines, Ill.)—"Kerpro" regular and multicolor spray paints, also the "Spraint" brand of paints.

30. *Nott Manufacturing Co.* (Poughkeepsie, N. Y.)—a line of aerosol insecticides.

31. *National Bird Control Laboratories* (Skokie, Ill.)—"Roost No More" bird repellent, "Crawlz No More" tree banding compound, and "Gnaws No More" rabbit, squirrel, and deer repellent. ★

A CORRECTION

It was incorrectly reported, in an Oct. story titled "Hair spray Patent has First Court Test," that General Aniline & Film Corp. is helping Donaldson defend itself" against LaMaur. Actually, General Aniline has remained *neutral* in this litigation. Our apologies to GAF for incorrectly stating their position.

—The Editor

Non-Aqueous Foams

(From Page 39)

emulsion, possibly as the result of altering the solubility relationships. Thus the substitution of ethyl alcohol for 5% of the propylene glycol in an emulsion prepared with 86% propylene glycol, 4% self-emulsifying propylene glycol monostearate, and 10% Propellants 12/114 (40/60) improves the emulsion properties considerably and gives a finer dispersion of the emulsion.

5. Method of Preparation

The method of preparation of the dispersion of surface active agent in the glycol has a profound effect upon the properties of the final emulsion. The present formulations were prepared by heating the mixture of surface active agent and glycol with agitation until the surface active agent dissolved. The solution was cooled with stirring until the agent separated from solution. The mixture was then forced through a hand homogenizer. It was observed that the use of the hand homogenizer gave much finer emulsions than could be obtained merely by heating the mixture and cooling with stirring.

IV. Effect of Other Solvents

A. Ethyl Alcohol

Ethyl alcohol has many desirable properties as a component of cosmetic and pharmaceutical formulations. It has low toxicity and very good solvent properties. Ethyl alcohol will destabilize emulsions, however, if present in sufficient concentration. In the nonaqueous emulsions, concentrations of ethyl alcohol up to about 10% by wt. may be added without seriously affecting foam stability. Concentrations of 15% may have an adverse effect. The effect of ethyl alcohol upon foam stability is shown by the data in Table VIII.

The mechanism by which ethyl alcohol destabilizes the foams is not known but it is probably related to the fact that ethyl alcohol is a good cosolvent for propylene glycol and the fluorinated hydrocarbon propellants. At a concentration of 10% ethyl alcohol, the mixture of propylene glycol, ethyl alcohol, and Propellants 12/114 (40/60) is not homogeneous. The components are not mutually soluble and form two liquid phases. This system forms an excellent foam when propylene glycol monostearate is present as an emulsifying agent. At a concentration of 15% ethyl alcohol, the mixture of propylene glycol, ethyl alcohol, and Propellants 12/114 (40/60) is homogeneous. All of the components are mutually soluble. This system does not form a stable foam. These results correlate with those observed previously with the glycols alone, i.e. that the glycols with the best solubility for the propellants gave the poorest foams. In this case the mixture of propylene glycol and 15% ethyl alcohol might be considered as a glycol that is miscible with the propellant.

An interesting series of pressure sensitive foams may also be formulated by the addition of ethyl alcohol to the emulsion. An emulsion containing 76% polyethylene glycol 400, 10% ethyl alcohol, 4% self-emulsifying propylene glycol monostearate, and 10% Propellants 12/114 (40/60), for example, gives an excellent foam. However, pressure of the hand

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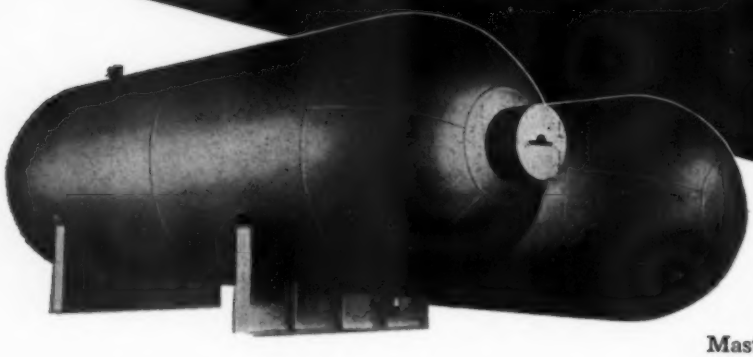

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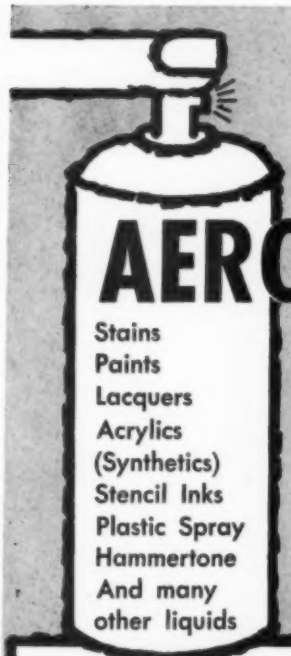

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on the foam causes an immediate breakdown of the foam structure with liquefaction of the foam. The extent to which the foam is sensitive to pressure may be regulated by the proportion of ethyl alcohol that is added.

B. Water

Water may also be added to the emulsion system to provide increased solvent power for water soluble active ingredients. Water has a marked detrimental effect upon foam stability, however, and should be omitted if possible. The effect of varying concentrations of water upon foam stability is shown by the date in Table IX.

The addition of water to the emulsion system decreases the solubility of the propellant in the glycol slightly and on this basis would *not* be expected to decrease the stability of the foam. However, with water present, the system is no longer nonaqueous and propylene glycol monostearate does not give particularly good foams with aqueous aerosol systems.

TABLE X

PRESSURES OF EMULSION SYSTEMS

Composition of Emulsion System (Pts. by Wt.)

Propylene Glycol	*Glycol Monostearate Propylene*	*Propellant* 12	*Propellants* 12/114 (40/60)	*Pressure (psig at 70° F.)*
86.0	—	10.0	—	67.5
86.0	4.0	10.0	—	66.5
86.0	—	—	10.0	37.0
86.0	4.0	—	10.0	38.0

V. Pressure of the Emulsion Systems

The vapor pressures of the emulsion systems in general are slightly less than that of the pure propellants. The emulsifying agent has no effect upon the pressure. Pressures of a number of representative emulsions are given in Table X. The samples were prepared by pressure filling but the vapor phases of the samples were purged thoroughly before the containers were capped. The mixtures without emulsifying agents are included to show that the emulsifying agent has no effect.

The addition of other solvents, such as ethyl alcohol, would affect the pressures, of course.

VI. Potential Aerosol Products

The nonaqueous foam systems offer a number of possibilities for aerosol products, including applications such as vaginal foams, suntans, ointment bases, burn preparations, antiperspirants, etc. Table XI lists a number of formulations that might be considered as starting points for such products.

The storage stabilities of the nonaqueous foam systems have not been investigated. Therefore, in the formulation of any products with these systems, it is essential that the storage stability of the formulations be

TABLE XI

SUGGESTED FORMULATIONS FOR NONAQUEOUS AEROSOL FOAM PRODUCTS

	Wt. %
Sun Screen	
Propylene glycol	76.0
Glycerine	6.0
Dipropylene glycol salicylate	4.0
Self-emulsifying propylene glycol monostearate	4.0
Propellants 12/114 (40/60)	10.0
Ointment Base	
Polyethylene glycol 400	86.0
Self-emulsifying propylene glycol monostearate	4.0
Propellants 12/114 (40/60)	10.0
Insect Repellent	
Propylene glycol	66.0
Glycerine	6.0
N, N diethyltoluamide	14.0
Self-emulsifying propylene glycol monostearate	4.0
Propellants 12/114 (40/60)	10.0
Waterless Leather Conditioner	
Propylene glycol	66.0
"Veegum"*	0.5
Hexachlorophene	0.5
Neatsfoot Oil	3.0
Beeswax	5.0
Carnauba wax	10.0
Soluble lanolin	1.0
Self-emulsifying propylene glycol monostearate	4.0
Propellants 12/114 (40/60)	10.0
Antiperspirant	
Propylene glycol	68.8
Self-emulsifying propylene glycol monostearate	4.0
Aluminum chlorhydroxy ethylate**	17.2
Propellants 12/114 (40/60)	10.0

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studied. Such factors as the effect of the glycol system upon container linings and components of the valve must be determined. Likewise, extensive tests must be carried out to insure that agglomeration of the dispersed surface active agent does not take place during storage with subsequent clogging of the valve or leakage of propellant. With pharmaceutical products in particular, studies must be carried out to determine if any loss of activity of the active ingredients occurs during storage.

As previously mentioned, the nonaqueous foam products are prepared with a relatively nonvolatile base. Therefore, they are not suitable for applications where rapid drying is desired.

The formulations in Table XI were prepared with active ingredients commonly used in products for these applications. No search has been made to determine if the use of any of the components of the formulations is covered by existing patents. Therefore, the patent situation with respect to any of the products must be investigated before marketing is considered.

VII. Summary

A new aerosol emulsion system producing nonaqueous foams is discussed. In this system, glycols or glycol derivatives have been substituted for the water in conventional formulations. Foam stability may be varied to obtain very stable foams or quick-breaking foams by proper selection of the glycol, the surface active agent, or the propellant in the aerosol formulation. A number of potential aerosol products utilizing this system are presented.★

VIII. References

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2. Dow Chemical Co. Technical Bulletin, "Dow Propylene Glycol, USP."
3. Glycerine Producers' Association Technical Bulletin, "Why Glycerine for Drugs and Cosmetics?"
4. Union Carbide Chemicals Co. Technical Bulletin, "'Carbowax' Polyethylene Glycols."
5. Glyco Products Co. Technical Bulletin, "Esters by Glyco."
6. Atlas Powder Co. Technical Bulletin, "A Guide to Cosmetic and Pharmaceutical Formulation with Atlas Products."
7. "Clayton's 'The Theory of Emulsions and Their Technical Treatment,'" Fifth Edition, the Blakiston Co., New York, 1954.

Room Deodorants

(*From Page 26*)

branes. The degree of irritation has been found to increase sharply with decreasing particle size. This is why the perfume must be chosen with exquisite care when the air freshener is one which provides a very fine mist.

Because all the odorous ingredients in a perfume—the top notes, the middle notes, and the fonds—strike the olfactory center at the same time, the perfumer must create his fragrance with the intended aerosol use clearly in mind. The dominant note of a conventional perfume may easily become so powerful in an aerosol mist that all the other supporting notes will pale into insignificance. This is the reason why many of the most successful aerosol perfumes have a rather nondescript redolence when smelled in the bottle.

Suffice it to say that the problems involved in the technical aspects of aerosol perfumery are legion, and that it is a good idea to use only the tested products of a well recognized house.

Nearly all air freshener perfumes have a firm floral background. The florals create a definite impression of quality and elegance. This impression is so persuasive, in fact, that a pine scented freshener deficient in floral support would immediately be classed as a disinfectant or medicinal product, and its use limited to the bathroom or laundry areas in the home.

The most popular fresheners carry light, fleeting floral perfumes, often built around rose and carnation. The florals fit in nicely with formulations containing methylene chloride or 1,1,1-trichloroethane. Spice fragrances, which were so very popular in the 1940's, are now making a strong comeback. Probably the most dramatic newcomers are the lemon-bouquet and citrus fragrances. These perfumes are rising very fast in popularity. Although the standard mint, pine, apple blossom and cologne scents are not quite so well regarded, they are often used to round out a merchandiser's line of air fresheners.

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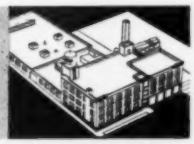

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fresheners. In one instance, a product of this type had to be changed because it gave an odor reminiscent of that of funeral parlors. Strident, dominating notes should be suppressed; in fact, any odor strong enough or different enough to inflict itself upon the consciousness of persons in contact with it should never be used in air fresheners. Heavy oriental, cedar and eucalyptus odors are examples of those which should be avoided.

A variety of special-application air fresheners are now on the market, and they sometimes require unusual perfumes. Of course, lavender is still preferred for sachet sprays, but light orientals and jasmin lavender bouquets are becoming increasingly popular. French poudre aldehydic fragrances and cashmere types are widely used for nursery sprays. Lastly, florals with siberian pine, citrus or oriental citrus overtones are now extensively used for institutional air freshener aerosols.

Aside from the perfume, the active material will usually contain a diluent of the petroleum distillate type. The earliest formulas carried about 9 to 14% mineral oil.[62] In addition to being quite odorless, the mineral oil successfully masked much of the odor of methylene chloride, which was also included in many of these formulations. Apparently the methylene chloride odor was less familiar to people, and therefore more objectionable in those days than it is now.

One of the great problems with mineral oil was its high viscosity. This meant that an excessive amount of propellant was necessary in order to get a spray where the particles were so fine that the perfume fragrance was not suppressed. Coarser sprays tended to deposit a long-lasting film of oil on exposed surfaces. The mineral oil deodorants vanished from the market when odorless, lower-boiling distillates became available in 1952. These new products, variously called deodorized kerosenes or odorless base oils, were far less expensive than mineral oil and could be used in concentrations up to 20% because of their much lower viscosity.[62]

Many modern air fresheners use odorless base oils. The really good base oils have less odor than any other liquid petroleum product. They flash at about 130° F. and boil in the range of 370° to 520° F.

Unless the odorless base oil is selected with some care, it may impart a fatty or slightly œnanthic odor to the basic fragrance of the air freshener perfume. The low volatility of most base oils tends to hide or reduce these odors in the pure distillate, so it is good practice to test those from new sources by first preparing a laboratory sample of the finished air freshener and checking its odor against that of a standard.

In 1953 a new, completely synthetic distillate appeared and immediately began to assume a prominent place in room deodorant formulations. Generically called "odorless

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mineral spirits," it was produced by the alkyd condensation of certain hydrocarbon gases, using a modification of the basic process developed during World War Two for the synthesis of hi-test gasolines. The distillate is composed of highly branched and globular iso-paraffins of about C_{12} complexity. The flashpoint is about 125° F., and the normal distillation range runs from about 350° to 410° F. Special cuts are available which distill within a range of less than 30° F.[63] but they offer no particular advantages when used in air freshener formulations.

Odorless mineral spirits is a clear, water white liquid having a very faint sweet scent. The odor is quite variable. In many cases an experienced person can actually identify the source by smelling the pure material. Several refineries do not turn out odorless mineral spirits of air freshener quality. This makes it necessary to approve samples known to come from a certain plant and to specify that production quantities shall come only from the approved refinery. Such precautions are particularly necessary when dealing with re-sellers or with oil companies having multiple sources of supply.

One of the primary advantages of odorless mineral spirits comes from the fact that it can be used in amounts up to 25% in air freshener formulas and still allow the development of a fine mist. This is due not only to its relatively low viscosity, but also to its poor solvency characteristics, which tend to minimize the importance of van der Waal's bonds with the propellant. Because of these weak bonds, the distillate and propellants separate easily upon spraying and give a particle size median which is smaller than otherwise anticipated.

Methylene chloride has been used as a so-called aerosol propellant since 1948.[64] Although most of these early propellants were composed of equal amounts of Propellant-11 and Propellant-12, in some instances methylene chloride was used to replace either all or a portion of the Propellant-11.[66] It is interesting to note that, since millions of these aerosols were marketed before the industry realized that weight losses occur on storage, the gradual changes in air fresheners that used such prodigious amounts of methylene chloride must have caused a certain amount of consternation. More recently, economic considerations have caused a renewed interest in methylene chloride formulas. Many deodorants now contain 20 to 25% of this solvent, with a few going as high as 36%.

Within the last several years still another halogenated solvent, 1,1,1-trichloroethane, has attained importance as a replacement for methylene chloride. Since its boiling point is considerably higher, it would normally be expected to produce a heavier spray. Yet this is not the case unless very large amounts are present. The apparent anomaly is explained on the basis of the higher molecular weight of 1,1,1-trichloroethane. A given percentage does not reduce the mole fraction of true propellant to the same degree as methylene chloride, and because of this the 1,1,1-trichloroethane aerosols should give finer sprays. Actually, the mole fraction advantage is offset by the onus of lower volatility, with the net result that the two solvents act very much the same—at least in amounts up to about 25% or so. Finally, 1,1,1-tricholorethane has been said to reduce aerosol weight losses, act less powerfully on plastic surfaces and to possess other advantages over methylene chloride.[67]

Perfume-Type Air Fresheners

Ingredients.	XVIII.	XIX.	XX.	XXI.
Perfume	0.5%	0.5%	0.5%	0.5%
Odorless Mineral Spirits	24.5%	—	9.5%	9.5%
1,1,1-Trichloroethane	—	—	—	26.0%
Propellant-11	37.5%	49.8%	45.0%	19.0%
Propellant-12	37.5%	49.7%	45.0%	45.0%
Reference	(47)	(47)	(41)	(67)
Year Published	1959	1959	1958	1958

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A number of formulations, published for the perfume type air freshener, are given on the previous page.

They seem to be based on the use of a standard 0.5% perfume, in combination with up to 25% deodorized kerosene or odorless mineral spirits.

Many of the new formulas contain higher amounts of perfume in order to combat odors more effectively. Castor oil, isopropyl myristate, or diethylene glycol may be added in amounts up to 1%, since they are effective in reducing the harshness of deodorant compounds in the perfume. They also moderate the haloid smell of the propellants.

Combinations of ethanol and odorless mineral spirits are now used in a few air fresheners. The ethanol is desirable, since it adds a touch of moistness and wholesomeness to the fragrance. Because it is fairly volatile and less flammable than odorless mineral spirits, it has been possible to formulate this type of freshener with as high as 32% active material.

Ethanol should not be included in an air freshener without a thorough evaluation of storage test data. Since ethanol may oxidize under certain conditions, forming acetaldehyde, which is both corrosive and malodorous, it is a good policy to include a trace of hydroquinone, or a similar chain-breaking type anti-oxidant in the formulation.[120] Ethanol is used exclusively in the sachet spray, generally in amounts from 20% to 30%.

Ethanol evaporates quite rapidly when dispensed as a mist. As a result, the air fresheners which contain ethanol often have a smaller particle size than those based on straight petroleum distillates. This change affects the fragrance, since the perfume always comes out more vividly and powerfully in a finer spray. If the heavier notes that now leap into prominence are quite different from the lighter ones, a significant alteration in the total perfume odor may take place.

The latest developments show that certain combinations of isopropanol and water, or ethanol and water, may be used to act as the diluent solution

for perfume type air fresheners.[68] Although isopropanol is a superior cosolvent and permits the use of more water in the formula, its odor is rather strong and cannot be completely masked. Special inhibitors are also necessary in order to protect the dispenser against the ravages of these alcohol solutions. In spite of the problems involved, there is a certain amount of activity in this area because of the economies that can be obtained.

Many changes have taken place in the selection of propellants for air fresheners. The original ones were composed of half Propellant-12, with the other half made up of either Propellant-11, methylene chloride, or some combination of the two. These ideas hold fairly true even in most modern formulas, unless hydrocarbon propellants or special systems are used. Depending upon the nature and percentage of the active materials, from 35% to 45% of the formula must be composed of Propellant-12 if the desired range of pressures and particle sizes is to be achieved.

Several hydrocarbon gases are now being used in air fresheners, where they act as replacements for a portion of the halocarbon propellant. As a rule, it is possible to include from 6% to 15% in the formula before it "goes flammable."[69] The exact amount depends upon the amount of flammable material already present in the formula.[121]

The first hydrocarbon to be used in air fresheners was iso-butane. Because of its vapor pressure, it functions best as a replacement for Propellant-50/50 (12:11). A combination of 90% halocarbons and 10% iso-butane has been used for several years under the trade-name of "Propellant A."[70] Iso-butane is also used as a replacement for straight Propellant-12; the somewhat lower pressure of such formulations being compensated by the advantage resulting from a higher mole fraction of total propellant.

When propane is used, it generally replaces *all* the Propellant-12 in the formulation and functions as the only true propellant. From 9% to 15% propane is enough to provide an excellent space spray. Such formulas can hold up to 25% odorless mineral spirits and similar diluents before they go flammable.[121]

Several examples are now given to illustrate these more modern ideas:

Another propellant, carbon dioxide, was used in perfume aerosols as early as 1903.[3] Since then it has been suggested many times as a nearly ideal propellant.[40] After an extensive program to adapt carbon dioxide to low pressure aerosols, several cosmetics products have now appeared on the European market which make use of this gas as the sole propellant. These aerosols contain about 8% carbon dioxide, and their internal pressure is in the order of 100 psi-gauge at 70° F.[71]

Carbon dioxide is a polar molecule, and by utilizing this property, which is fairly unique in a high pressure gas, it has been possible to create air fresheners which provide good space sprays at pressures as low as 80 psi-gauge at 70° F. These aerosols may be made non-flammable by the application of special formulating techniques and by refinements in the dispenser.[72]

Nitrous oxide works nearly as well as carbon dioxide in such formulations, except that here the propellant is flammable and it is more difficult to create a system which will comply with existing regulations and still give a satisfactory spray.

A great deal of work has also been

Ingredients.	XXII.	XXIII.	XXIV.	XXV.	XXVI.	XXVII.
Perfume	0.8%	0.6%	2.5%	0.8%	0.5%	0.5%
Isopropyl Myristate	1.2%	1.0%	—	2.0%	—	0.5%
Odorless Mineral Spirits	25.0%	20.0%	—	—	19.5%	24.0%
Ethanol (Anhydrous)	—	8.4%	22.5%	47.2%	—	—
Methylene Chloride	20.0%	—	—	—	25.0%	—
Water	—	—	—	9.0%	—	—
Propellant-11	16.0%	31.5%	41.3%	—	15.0%	60.0%
Propellant-12	37.0%	38.5%	33.7%	41.0%	30.0%	—
Iso-butane	—	—	—	—	10.0%	—
Propane	—	—	—	—	—	15.0%

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done on the formulation of emulsion aerosols of the space spray type.[73,74] These systems are said to offer the ultimate in economy, since the bulk of the material is water. Although some truly excellent sprays can be produced with emulsion aerosols, they all suffer from one great disadvantage; regardless of how stable the emulsion may be, it eventually separates into phases. Ordinarily this could be overcome by shaking the dispenser before use, except that stratification *also occurs in the dip tube*, where no reasonable amount of shaking is sufficient to reconstitute the layers. This means that the initial spray from emulsion aerosols is apt to produce some rather startling patterns.

When formulating techniques have been perfected to the point where stable emulsions or gels can be obtained, and when other problems are resolved—such as the elimination of froth, inhibition of corrosion and reduction of the "powdery" surfactant odor—then the way should be open to a whole new era in the field of low cost, pressurized air fresheners.★

This is the second of three installments of Mr. Johnsen's detailed and complete article on the subject. The December installment will discuss the glycols and the quaternary salts as deodorants.—The Editor.

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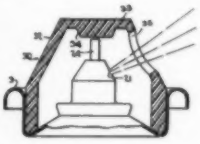
New Aerosol Patents

Listed below is a brief review of recent patents pertinent to the aerosol and related industries.

Complete copies of these patents may be obtained by writing to the Commissioner of Patents, U. S. Patent Office, Washington 25, D. C., and remitting 25 cents for each copy desired.

2,951,646. FLUID DISPENSING VALVE. Issued Sept. 9 to John T. Efford, Stratford, and Lester Clifford Morton, Danbury, Conn., assignors, by mesne assignments, to Shulton, Inc., a corporation of New Jersey.

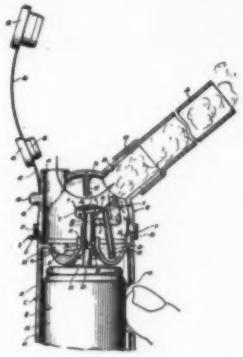


A fluid dispensing valve including a hollow valve body having a substantially conical internal surface, and a valve head having an annular portion forming a relatively sharp peripheral corner seating in said conical surface, said corner being made of material which is flexibly deformed both radially and axially by said corner wedging in said surface, said body having fluid openings on the opposite sides of said head, said opening on the side of said head nearest said conical surface being in the form of an outlet spray orifice extending through said conical surface and said body at a location adjacent to said corner when the latter is wedged in said conical surface, said body otherwise forming a closed space on said side of said head, a flexibly deformable cap covering the portion of said body on said side of said head and having an opening registered with said outlet spray orifice, and a stem projecting through said body portion through an opening formed therethrough, said stem having an inner end which engages and unseats said head when said stem is pushed inwardly and having an outer end adjacent to the inside of said cap so that pressure on the outside of the latter deforms said cap and is transmitted to said stem's outer end.

•

2,951,644. DISPENSING DEVICE. Issued Sept. 6 by Thomas J. Mahon, Englewood, N. J., and Albert L. Edelstein, Bronx, N. Y., assignors, by mesne assignments, to Association for Physiologic Research, Inc., New York.

In a dispensing device, a normally upright casing, a head on the upper end of said casing formed with a central through socket and an upwardly facing trough, a dome covering said head on the upper end of said casing and having an outwardly inclined discharge spout, a propellant container received in spaced relation in said casing beneath said head, an upstanding normally closed discharge nipple on said container and extending snugly into said socket for fluid communication therethrough, said nipple being openable upon relative displacement between said container and nipple and resiliently urged out of said displaced relation to close said nipple, and a nebulizing fitting carried by said head interiorly of said dome and communicating with said nipple and trough for aspiration of fluid from said trough by



propellant from said container and the projection of said fluid and propellant through said discharge spout.

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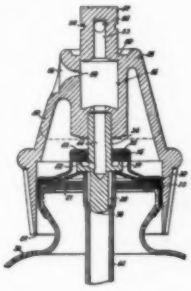
2,952,278. SPRAY HEAD AND FILLING PLUG. Issued Sept. 13 to Wilhelm Waldherr, Roentgenstrasse — Ecke Cheliusstrasse, Mannheim, Germany.

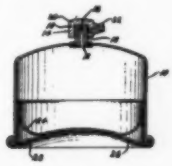


For use with a fluid dispenser comprising a fluid container and a dispenser valve: a spray head mounted on the valve, said spray head having an axial bore communicating with the valve and a lateral spray outlet communicating with the axial bore, and a two-position hollow plug having substantially the same outer diameter as the diameter of the axial bore, said hollow plug being detachably connected to and extending above the spray head at the upper end of the axial bore and having a lateral fluid inlet opening and an annular groove in communication therewith, whereby the container may be filled with fluid in a first position of the plug through said inlet opening, axial bore and valve, and the hollow plug being displaceable in a second position upon detachment from the spray head so as to be contained within the upper end of the spray head while the annular groove in the plug communicates with the lateral spray outlet.

•

2,953,304. DISPENSING CONTAINER. Issued Sept. 20 to Burton Sellinger, Jackson Heights, N. Y., assignor to Colgate-Palmolive Co., Jersey City, N. J.

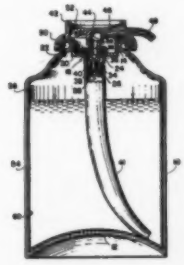
A multi-discharge valved dispensing container for a pressure propelled product comprising an upright cylindrical outer casing having a discharge outlet at the top of said casing; a product discharge valve closing said discharge outlet; a recessed bottom closure member crimped to the base of said cylindrical outer casing and having a substantially smooth central inner surface; and a collapsed non-permeable, non-resilient flexible metallic diaphragm sealed at its periphery in said crimp and having when fully distended, substantially the shape of the interior of said cylindrical casing; said diaphragm being centrally collapsed by a product which is to be dispensed from said container, said product being sealed within a valved chamber formed by said cylindrical outer casing,



said product valve, and said diaphragm; said smooth central inner surface of said recessed bottom closure supporting said centrally collapsed diaphragm and said product bearing thereon without puncture of said diaphragm and forming with said diaphragm a sealed chamber containing gaseous propellant; said gaseous propellant serving to subject said diaphragm to distensive pressure causing said diaphragm to displace and dispense said product and assume substantially completely the shape of the interior of said casing when said valve is opened.

•

2,953,284. PRESSURIZED DISPENSER. Issued Sept. 20 to Samuel B. Prussin, Westport, and Herman R. Shepherd and Fred Presant, Bridgeport, Conn., assignors to Aerosol Techniques, Inc., Bridgeport, Conn.



A dispenser comprising in combination: a container; a viscous bulk substance having a viscosity of at least 1000 centipoises at 20° C. which is to be dispensed, said substance partially filling said container; a pressurized medium in the remaining portion of said container which is insoluble in said viscous substance exerting pressure directly on the upper surfaces of said substance, the said pressurized medium being a propellant gas which acts as a piston against the upper surface of said substance; and a lubricating medium being present on the interior surfaces of said container to facilitate dispensing of said substance from

said container by means of said pressurized medium, said lubricating medium being incompatible and insoluble in said substance and being adherent to the inner surfaces of said container whereby the dispensing movement of said viscous bulk substance under the piston action of said gas occurs without cavitation of said substance and without an increase in bulk of said substance after dispensing due to the dissolving and fragmenting action of said gas on said substance.

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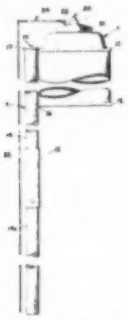
2,953,283. DEVICE FOR REMOTE OPERATION OF AEROSOL. Issued Sept. 20 to Emil L. Palkowski, R.F.D. 2, Spring Lake Township, Ottawa County, Mich.



In combination with a portable container adapted to dispense a liquid under pressure in aerosol form, said container having a discharge member incorporating a valve adapted to be opened upon rocking of said discharge member; a lever; one end of said lever press-fitted about said discharge member and encircling said discharge member more than 180°; said lever being pivotally movable in a vertical direction to rock said discharge member and open said valve; the other end of said lever extending beyond the sides of said container and means secured to said other end of said lever for operating said lever from a point remote from said container.

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2,951,614. PRESSURE CONTAINERS AND IMPROVEMENTS IN SAFETY CONSTRUCTIONS THEREFOR. Issued Sept. 6 to Theodore Greene, 1904 Gardenia Ave., North Merrick, N. Y.

A container comprising a body including upper and lower body members, the lower of said body members being secured at its upper portion to the lower portion of the upper one of said body members to define an expansion space when the same rests upon a surface, said lower body members having a plurality of exhaust vents defined therein to provide a communication between said space and the atmosphere, an imperforate wall between said upper and lower body members, a fluid chamber in said upper body member in which an expansible pressure fluid is contained, a rupture device in said wall including a rupture plate having a weakened area thereof to rupture and break outwardly when subjected to a predetermined pressure of said expanding fluid and an orifice plate spaced from said rupture plate to define a pressure chamber therebetween, an orifice in said orifice plate of a size smaller than said pressure chamber to provide communication between said fluid and pressure chambers, said orifice serving to meter the amount of expanding fluid escaping outwardly from said break in said rupture plate.

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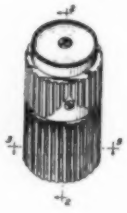
Design Patent 188,882. DISPENSING ATOMIZER FOR PERFUME OR THE LIKE. Issued Sept. 20 to Sonia Jokelson Boris, Paris, France, assignor to Societe Technique de Pulverisation, Paris, with priority claimed as per French application Oct. 17, 1958.



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2,952,584. TREATMENT OF CATTLE. Issued Sept. 13 to Homer E. Whitmire, Clayton, and Blanton J. Whitmire, Richmond Heights, Mo., assignors to Whitmire Research Laboratories, Inc., St. Louis.

The method of killing larvae infesting an open wound or pocket in the flesh of cattle, comprising depositing, by spraying on the infested area of an animal, droplets of liquid containing at least about 10% of a liquified low pressure propellant gas dissolved in a mixture of larvicide and film-forming agent, until the area is covered with liquid; said film-forming agent being such as to produce a film at the exposed surface of the liquid before a substantial amount of the liquified propellant gas has vaporized under the body heat of the animal; said film being of a character such as to permit gas to escape slowly through it when gas pressure is built up behind it by boiling of the volatile constituents of said liquid caused by the body heat of the animal; said build-up pressure substantially simultaneously forcing the larvicide into the wound.

•

Eastern Cap Moves Offices

Eastern Cap & Closure Co., Baltimore manufacturer of metal aerosol caps, recently moved its plant and offices to a new building at 726 N. Kresson Street. The firm's telephone number, EAstern 7-5640, remains unchanged.

According to C. O. Barnes, Eastern Cap president, the move was made to provide the company with larger and more efficient facilities.

Trade Mark Application

Applications for registration of the following trademarks were published in recent issues of the *Official Gazette* of the U. S. Patent Office. In not all cases are there strictly aerosol trademarks, however, many of the products listed below come within the category of those for which a possible future use in aerosols is foreseen.

LINGER, for medicated desensitizing ointment. Filed March 14 by Paul R. Paradise, d.b.a. Bancroft Laboratories, Chicago, claiming first use Feb. 25.

VAGA-SPRAY, for aerosol vaginal cleanser. Filed April 15 by Menlo Park Laboratories, Inc., Perth Amboy, N. J., reporting first use March 25.

SPRAY-FIX, for lacquer coating material for use as an artist fixative. Filed Aug. 6, 14959 by Henry D. Blair, d.b.a. Blair Art Products, Memphis, Tenn., giving first use as Sept. 1, 1951.

RUSTCOR, for rust inhibitor as an ingredient of paint. Filed Nov. 10, 1959, by Illinois Bronze Power Co., Chicago, with first use claimed for Oct. 16 of same year.

KILTONE, for insecticide. Filed Oct. 19, 1959, by Acme Quality Paints, Inc., Detroit, claiming first use Sept. 18, 1959.

SASHAY, for lavender spray or closets, lingerie, and laundry. Filed Jan. 23, 1958 by Henry Thayer Co., Cambridge, Mass., reporting first use Nov. 7, 1957.

SPRADIENCE, for hair spray. Filed July 1, 1959 by Richard Hudnut, Morris Plains, N. J., giving first use as June 19 of same year.

AERO-LOK, for hold down device for valves of aerosol dispensers. Filed April 25 by Cook Chemical Co., Kansas City, Mo., with first use claimed for Jan. 7.

BAND-A-BOMB, for antibiotic spray bandage, for burns, cuts, abrasions, and lacerations. Filed May 19, 1958 by Sigma Pharmacal, Inc., Minneapolis, with first use reported as April 3, 1958.

Z.I.P., for deer and rodent repellent. Filed March 21 by Morton Chemical Co., Chicago, with first use given as on or about Sept. 3, 1952.

SIL-SPRAY, for chemical preparation in an atomizer container which is sprayed on phonograph records to free said phonograph records from static. Filed April 8, 1959 by Jensen Industries, Forest Park, Ill., claiming first use March 10, 1959.

EVEREADY, for insecticide in pressurized dispensing containers. Filed Feb. 19, 1958 by Eveready Pressurized Products, Inc., Cleveland, Ohio, giving first use as Nov. 26, 1956.

SCOR, for insecticide spray solution. Filed March 31 by Lien Chemical Co., Franklin Park, Ill., with first use reported as April 13, 1959.

CLASSIFIED ADVERTISING

Address all classified replies to Box Number c/o *Aerosol Age*, PO Box 31, Caldwell, N. J. Rates for "Help Wanted" advertisements are 20¢ per word; minimum charge $3.00. Rate for individuals seeking employment is 5¢ per word, $1.00 minimum. Advertisements of new machinery, products and services accepted at the rate of $10.00 per column inch. Minimum space, one inch. Copy closing date, 10th of preceding month. *Checks must accompany all orders.*

HELP WANTED:

CHEMIST
CAREER OPPORTUNITY

As chief of chemical development laboratory in an international manufacturing company, (located in the New York metropolitan area), which is establishing a new division in the aerosol field. BS degree plus some aerosol experience required, involving analysis and tests in a diversified chemical field.

Excellent Company-paid Benefits.
Cost of living Adjustment.
5-day week.

Please send resume including education, experience, and salary requirements, to: **Box AA 676, 125 W. 41 St., N.Y. 36, N. Y.**

PRODUCTION SUPERVISOR AEROSOL

Leading manufacturer expanding its aersol dept. requires the services of a top notch supervisor with experience in this area. This is an unusual growth opportunity offering a good starting salary plus generous employee benefits. In confidence send detailed resume & salary requirements. Our staff knows of this ad. Box 230, Aerosol Age.

MISCELLANEOUS:

Export Firm needs aerosol enamels, lacquers, multicolors, detergents, insecticides, agricultural & garden specialties, waxes, and all types of aerosol specialties and products. Write P.O. Box 11, Woolsey Station, Long Island City 5, N. Y.

FOR SALE:

FOR IMMEDIATE LIQUIDATION

90,000 American 202 x 214 Cans
60,000 Precision Valves
12,000 Precision #4B Spouts
19,500 Precision #5 Foam Spouts
65,000 Precision #5 Domes
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CONTACT:
Leon Goodhart
MULTIPLE PRODUCTS CORP.
55 West 13th Street
New York 11, New York
CHelsea 3-5775

SITUATIONS WANTED:

SUPERVISOR OF SYSTEMS OR MANAGER — Wants position with exceptional opportunity in reorganization of rapidly growing plant. Experience in planning, conducting studies into accounting and clerical procedures, purchasing material and quality control, warehouse shipping, and with a view to improving methods of reporting. Supervision and responsibility for production and system staff accepted. Write Box 231, c/o Aerosol Age.

Givaudan's Durer Returns to U. S.

E. R. Durrer, president of the Givaudan Corp. and its associate companies, Givaudan - Delawanna, Inc.; Givaudan Flavors, Inc., and Sindar Corp., New York, recently returned from an extended European trip during which he visited the Givaudan plants abroad. He reported that the economy in Switzerland, and in Europe in general, is maintaining its vigorous pace, and that Givaudan plants abroad continue to operate in high gear.

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Bierbaum to Beckman Post

The appointment of William S. Bierbaum as a product line manager has been announced by George A. Green, product planning manager, Scientific and Process Instruments Division, Beckman Instruments, Inc., Fullerton, Calif. In his new position, he will be responsible for sales of the Beckman line of process and laboratory gas chromatographs and flame ionization analyzers. Prior to joining Beckman in 1957 as a field sales engineer in the Mountainside, N. J. office, he was an industrial engineer with the Eastman Kodak Co.

•

Gen. Chem. Names Pearson

Dr. John H. Pearson has been named director of advance research planning for the General Chemical Division of Allied Chemical Corp., New York.

O.I. Shifts Bensinger

C. G. Bensinger, executive vice-president of Owens-Illinois Glass Co., Toledo, has been assigned a major new responsibility in the management of the company's administrative and operating matters. In his new assignment he will become a member of the Management Committee of each of Owens-Illinois' nine operating divisions, and will continue as a member of the corporate Planning Committee. He was president of the firm's Glass Container Division since 1956 and has served the Division in other executive capacities since 1931.

The company also announced that R. H. Mulford, a vice-president of Owens-Illinois, will assume the responsibilities relinquished by Mr. Bensinger. These embrace the operations of the Glass Container Division —East, the Pacific Coast Division, and the Closure and Plastics Division. Mr. Mulford headed Kimble Glass Co., an Owens-Illinois subsidiary from 1953 until last month.

•

FTC Seeks Increased Funds

The Federal Trade Commission, which this year was more active against aerosol marketing firms than in any other five-year period in its history, is seeking an unprecedented increase in its budget. Washington observers point out that the agency is after a 50% increase in operating funds (for the year beginning next July 1) plus a 70% increase in manpower.

Both increases, if passed by the Budget Bureau and then Congress, would go toward increased activities in the FTC's two major areas of enforcement — protecting the consumer against misleading advertising and merchandising practices, and curbing monopolistic business practices through enforcement of the Robinson-Patman Act and other legislation.

As an example of its stepped-up activities, the FTC points to the fact that last year it issued 503 formal complaints, some 150 more than the previous year's total and equal to the total of the FTC for the period 1948 to 1952.

Nat. Starch Head Elected

Frank K. Greenwall, chairman of National Starch and Chemical Corp., has been elected president of Keep America Beautiful, Inc., at a recent meeting of the KAB board of directors held in New York City. He succeeds the late Cecil F. Dawson, former director and consultant of American Can Co.

Keep America Beautiful, Inc., the national public service organization for the prevention of litter, is supported by leading business firms, labor unions and trade associations, representing nearly every major industrial category in the United States.

Aerosols in Review

(*From Page* 30)

product is used in "Siz," a new pressurized charcoal lighter.

"Peterson manufactures the material from an emulsion produced by spraying a petroleum distillate into a strongly agitated solution containing certain emulsifiers. This forms a white cream of low viscosity. Cream is sent through the homogenizer, where it is transformed into the jelly-like finished product. Temperature of material going through the homogenizer is 60° F., with hardly any pick-up during passage.

"In the machine, known as the 'Jet-Mogenizer,' impact, attrition, turbulence and ultrasonic cavitation combine to deliver optimum homogenization at high velocity. The unit has 380 splines in the rotor-stator which have been deliberately thrown out of register so as to convert the fluid flow from a constant rhythmic vibratory pattern into an intermittent variable one. This causes subsonic effects which set up highly intensified turbulence in material being processed. Violent interparticle attrition follows as the fluid mass is forcibly impacted through the restricted spline vents.

"Peripheral velocity of particles reaches 4,500 r.p.m. Ultrasonic frequency vibrations exceeding 20,000 c.p.s. are generated as particles impinge on the sonic blade. Continuous cavitation is set up within particles. The result is a fully dispersed, smoothly blended emulsified product."

•

REPORTS in two widely separated trade publications recently quoted pyrethrum experts who point out that, despite troubles in Africa, the pyrethrum outlook remains good. In an interview published in the Oct. 10 issue of *Oil, Paint & Drug Reporter*, Wallace Chavkin, president of Biddle Sawyer Corp., U. S. sales representative for the pyrethrum growers in the Kivu Province of the Congo and Ruanda Urandi, reported that pyrethrum processsing has resumed after the recent trouble in the Congo. In July, N. H. Hardy, executive officer of the Pyrethrum Board of Kenya, told the July *East African Trade & Industry* that a big rise in the number of native growers made it possible that pyrethrum will soon become Kenya's major export crop.

Mr. Chavkin, who returned from a three-week tour of the East African growing area, worked with a UN supervisory team to effect a treaty between the Congo and Ruanda Urandi. The treaty was necessary because of a breakdown of the relations between the countries which cut off the Ruanda Urandi producers from the extraction plant in the Congo.

Prior to the agreement, he said, there was some concern that the Congo government might seize the flowers shipped in from Ruanda Urandi. He urged that the United Nations play a key role in assisting the Congo pyrethrum industry by: (1) Assisting in obtaining properly trained technical personnel; (2) interceding with the Congolese government to assure the continuation of the pyrethrum industry; (3) if necessary, assistance for the banks in financing and guarantees for the growers. He said he had worked out a plan with local planters to expand native production of the insecticide flower.

In Kenya, Mr. Hardy said, a new factory will be erected soon and is expected to be in operation by May or June of next year. Native growers, he reported, now outnumber European growers by 16 to 1 (as against a 2-to-1 numerical superiority by European growers five years ago). This, Mr. Hardy contended, together with the planned new extraction facilities and the recent agreement signed by the Mitchell Cotts Group and the Pyrethrum Board of Kenya, indicates a growing pyrethrum production, no matter how the political winds blow in that country.

•

AEROSOL fire extinguishers are not approved by Underwriters' Laboratories and therefore should be either not used at all or used with extreme caution, warns the October issue of *Consumer Bulletin*. In an article which draws special attention to the dangers of carbon tetrachloride, the magazine has this to say about aerosols:

"Lately there has been some use in unapproved extinguishers of still another volatile-liquid hydrocarbon with claims based on the fact that it is relatively non-toxic. This hydrocarbon is *Freon*,* used as the working liquid in refrigerators, freezers, and air conditioners for many years. Some, though not all, of the *Freons* present some of the dangers that carbon tetrachloride does, in the sense that when in contact with hot surfaces and open flames they can decompose into a number of highly poisonous substances, including chlorine, hydrogen chloride, fluorine, hydrogen fluoride, and phosgene. *Freon* of an unsafe kind may be used in extinguishers made by irresponsible or technically unqualified manufacturers, not suitable to receive approval by U.L. or other experts in the fire protection field."

The article also cautions about extinguishers employing methyl bromide, which it says are fairly common in Europe.★

* Although *Consumer Bulletin* calls fluorinated hydrocarbons "Freons," this could logically include other trade names for these materials. For more detailed information on this toxicity problem, see "The Toxicity of Fluorinated Hydrocarbon Aerosol Propellants" in the September 1960 issue of *Aerosol Age*.

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SCC to Honor Marriott

The 1960 Medal Award of the Society of Cosmetic Chemists has been bestowed upon Dr. Robert Henry Marriott, F.R.I.C., director of products research, County Laboratories, Ltd., Great Britain, for his contributions in chemical research in the cosmetic industry and in the leather trades.

Dr. Marriott's work has continued uninterrupted for almost 30 years, during which time he was twice president of the Society of Cosmetic Chemists of Great Britain. He was one of the first researchers to work in cosmetic rheology and helped plan the international congress on hair held in London two years ago. He also organized the first British Congress of Cosmetic Science in London. Dr. Marriott was elected the second president of the International Federation of Societies of Cosmetic Chemists to serve until August, 1961.

The medal will be awarded to Dr. Marriott at the Society's Annual Meeting and Award Dinner, Tuesday, Nov. 29, at the Hotel Biltmore in New York.

OVER THE TRANSOM

TYPICAL of some of the remarks we have heard about custom filling of late has been this one: "It'll be a cold winter for many of the major fillers. Plans by Toni, Gillette, and others to install filling lines, coupled with expanded production facilities by Avon, Boyle-Midway, and Colgate, will pull a large chunk of the filling business out of the custom fillers' plants by early next year." This one opinion, is probably far too pessimistic. At least three Eastern fillers have told us within the past few weeks that they are as busy as they've *ever* been for this time of year.

* * *

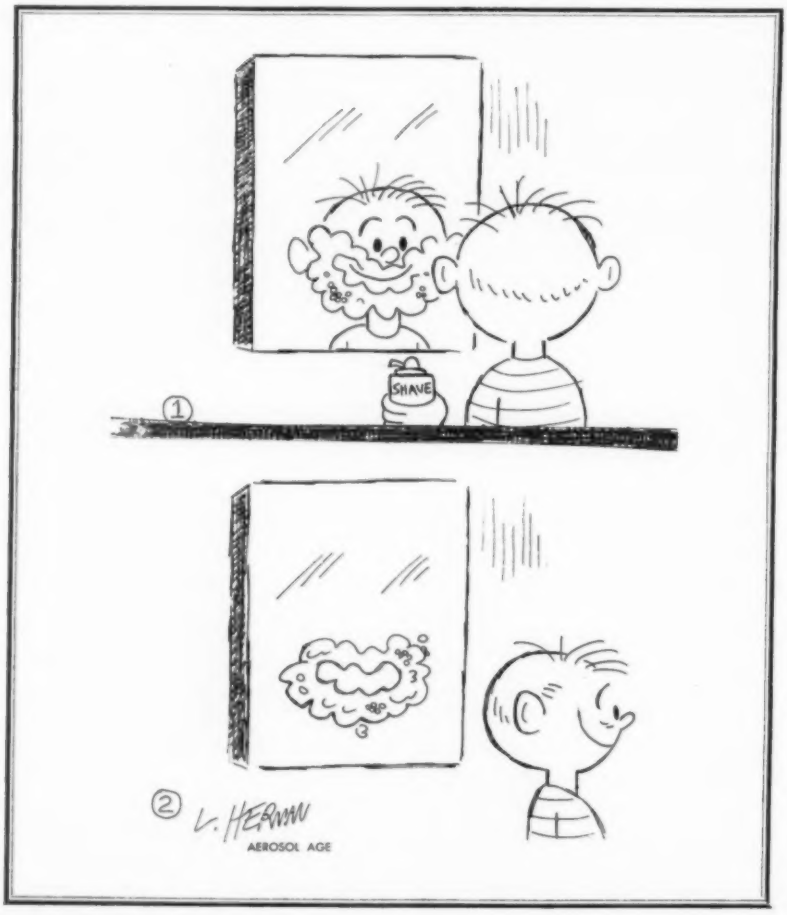
As this issue goes to press, there is still no word on the outcome of the Donaldson-LaMaur PVP Hair Spray case. And since the case was heard in closed session (and the participants cautioned not to discuss it until a decision is rendered), there hasn't been a hint yet about who came off best.

* * *

From the insecticide industry: Geigy's patent on DDT has expired and Shell has won its patent battle with Ciba for the DDVP patent.

* * *

The August issue of *Paint Journal*, British trade magazine, chides the British paint industry for its obviously faint-hearted efforts toward developing aerosol paints. "For some unaccountable reason, apart from one particular line of cellulose synthetic for car touch-up purposes, the British paint industry has only played about with this development in a *half-hearted way!*"



Not in a long time has an aerosol product generated so much optimism within the industry as has pressurized starch. We have heard some authoritative estimates that starches, within a year or two, may even challenge hair sprays, room deodorants, shave creams, and insecticides in the best-selling category. One impressive sign is an apparently genuine enthusiasm among housewives for the product, with that invaluable "word-of-mouth" advertising likely to account for a good portion of sales. Aerosol Corp. of America, Boyle-Midway, and now Lestoil are just a few of the marketers using big advertising money to recruit buyers for their products.

* * *

A new aerosol filling company will be organized in the South Oakland, Calif., area by Walter Wing, former technical director of Par Industries, Inc., and Arthur Mertens (formerly of Carling Brewing Co.). The two are combining engineering talents to make their own filling equipment.

* * *

***Consumer Bulletin*, one of several consumer product rating magazines which occasionally looks askance at aerosol products, in October complains that push-button "Lilt Home Permanent" is "not as convenient to apply in actual use as the television commercials would have you think." The *Bulletin* quotes one consumer who reports that it is difficult to apply on curls at the back of the head, even with a mirror. It is suggested that the regular type is easier to manage because it is applied by feel.**

* * *

Aerosol-dispensed ethylene oxide, a powerful disinfectant, is expected to play an important role in future space exploration, according to the U. S. Army Chemical Corps and the National Aeronautics and Space Administration. Seems as though one problem of surveying life on planets will be the danger that the space probe vehicle will be itself contaminated by microbes (which might logically propagate on newly reached planets). To avoid this real danger the outside of the space probe payload and the final rocket stage will most likely be sprayed with ethylene oxide, likely dispensed from a pressurized package.

Some examples of filling with hydrocarbon propellants at Peterson Filling

PRODUCTS LAUNCHED WITH HYDROCARBON PROPELLANTS

Propel Sales UPWARD — Cost Less Per Package Unit

Here at Peterson Filling, we are fully equipped for high-speed filling of pressurized units utilizing hydrocarbons (propane, butane, iso-butane, etc.) as propellants *with consequent savings in your costs per package-unit.*

Ideal for a wide range of products, these propellants are popular for use with starches, polishes, cosmetics, shaving cream, window cleaners, charcoal starters and many others.

We also fill pressurized units using halocarbons, nitrogen, or carbon dioxide and other inert gases. For *all* your filling needs... *including gravity liquid filling*... write, wire or phone...

PETERSON
Filling and Packaging Co.

HEGELER LANE • DANVILLE, ILLINOIS

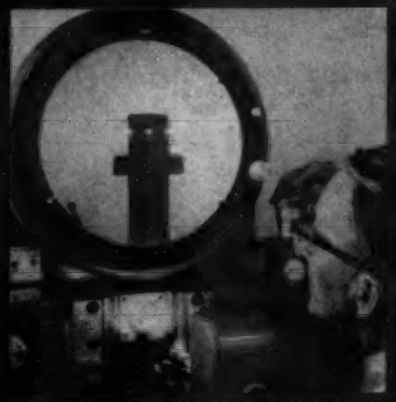
the UNSEEN ADVANTAGE of

RISDON Aerosol Valves

Protected Quality Performance

Strict, scientific, uncompromising quality control insures Risdon valve performance when your customer presses the actuator. This is the unseen advantage, the *extra* value you get from Risdon. It results in consistent, customer-pleasing performance that wins repeat sales.

At left, inspector uses hydraulic tester to simulate pressure conditions of filling. Technician on right uses special, custom made gauge to check the orifice in an actuator.



A contour projector accurate to one-half thousandth of an inch enlarges silhouette of valve components up to 50 times for precise checking of dimensions and contour.

In the quality control test on the left, actuators are being examined under a microscope. On the right, orifices of "Micro-Mist" actuators are being checked with a pin gauge.

THE RISDON VALVE LINE
includes

- **the GB Valve** – for glass, plastic & small metal containers with 20 MM opening
- **the 5210 Valve** – for standard 1" opening metal containers
- **the Metered Spray Valve** – for pre-measured sprays
- **the "Magna-Meter"® Valve** – for larger pre-measured dispensing of sprays, liquids or foams; for liquefied propellants and NITROGEN
- **the "Micro-Mist"® Valve** – for dispensing 3-Phase products or super spray performance on 2-phase products, liquefied propellants and NITROGEN

ALL RISDON VALVES ARE COVERED BY PATENTS OR PATENTS PENDING.

RISDON

THE RISDON MANUFACTURING CO.
AEROSOL DIVISION
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